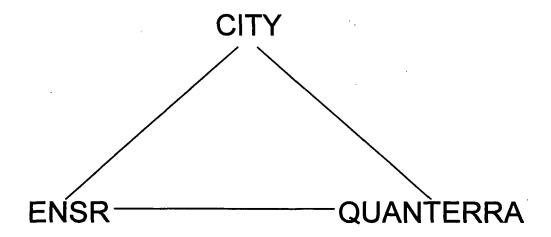


ANNUAL PERFORMANCE REPORT GRANULAR ACTIVATED CARBON TREATMENT SYSTEM FOR 1998

REILLY TAR & CHEMICAL CORP.
N.P.L. SITE
ST. LOUIS PARK, MINNESOTA

SUBMITTED MARCH 15, 1999





UTILITY OPERATIONS

CERTIFIED MAIL RETURN RECEIPT REQUESTED

March 15, 1999

Regional Administrator
United States Environmental
Protection Agency, Region 5
ATTN: Darryl Owens
Mail Code HSR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604

President
Reilly Industries, Inc.
300 N. Meridian #1500
Indianapolis, Indiana 46204

Director, Groundwater and Solid Waste Division Minnesota Pollution Control Agency ATTN: Site Response Section 520 Lafayette Road North ST. Paul. Minnesota 55155

Commissioner
Minnesota Department of Health
121 E. Seventh Place
P.O. Box 64975
St. Paul, MN 55164-0975

RE: United States of America, et al. vs Reilly Tar & Chemical Corporation, et al. File No. Civ. 4-80-469 CD-RAP 4.3.5

Gentleman:

Enclosed is the 1998 annual performance report of the Granular Activated Carbon treatment system submitted pursuant to Section 4.3.5. of the Consent Decree-Remedial Action Plan in the above captioned matter. This report is issued by the City in accordance with Section 2(a) of the Reilly/St. Louis Park Agreement (Exhibit B to the Consent Decree).

Sincerely,

Scott E. Anderson

Superintendent of Utilities

enclosure SEA/pmm

CC:

William Gregg (w/ enclosures)

Tom Scott (w/o enclosures)

Reilly File

RAP/anrapgac

ANNUAL PERFORMANCE REPORT FOR GRANULAR ACTIVATED CARBON TREATMENT SYSTEM - 1998

Operation:

The City operated the Granular Activated Carbon (GAC) treatment system in substantial compliance with Section 4.2 of the Remedial Action Plan (RAP) during 1998, treating 337.602 million gallons (mg) of water pumped from well SLP 10.

The results from the April sample of the GAC treated water indicated the total of other PAH's to be 76 ppt, well below the Drinking Water Advisory Level (175 ppt). The level had increased from 24 ppt in October of 1997. The past performance of the GAC indicated the GAC would experience breakthrough sometime during the winter months. Due to the difficulties of a winter change out an early change out of the GAC was scheduled for September. The early change out also assures the uninterupted supply of water which meets the quality standards established in the CD-RAP. The GAC change out was completed and the compliance sample was taken.

The annual monthly pumpages are shown in Table 1 which confirms the City was in substantial compliance with RAP Section 4.2.1 (i.e. a minimum of 200 mg must be pumped from SLP 10/15 annually and 10 mg must be pumped monthly).

Monitorina:

The 1998 monitoring program was jointly conducted by the City and Quanterra Environmental Services (Quanterra). The City retrieved all samples and Quanterra was responsible for analytical services. Laboratory analyses were conducted at the Quanterra laboratory in Arvada, Colorado.

The 1998 monitoring schedule (Table 2), as established in the 1998 Sampling Plan developed in accordance with the requirements of Section 3.3 of the RAP, provided for quarterly monitoring of the treatment system effluent and annual monitoring of the treatment system feed water, acid fraction analysis and extended PAH compounds. All samples were collected an analyzed in compliance with the CD-RAP. The acid fraction analysis was not completed in 1998. A summary of the 1998 GAC treatment system monitoring is shown in Table 3. All monitoring results indicate the GAC treatment system operated in compliance with the Drinking Water Criteria established in CD-RAP Section 2.2.

ADDITIONAL INFORMATION

The CD-RAP provides the operational criteria for the GAC facility located adjacent to Water Treatment Plant No. 1, located at 2936 Idaho Avenue (GAC-1) which treats water produced by municipal wells SLP 10 and SLP 15. The City constructed an additional GAC facility in 1994 located at 4701 West 41st Street (GAC-4) which treats water from municipal well SLP 4. This GAC facility is not referenced in the CD-RAP.

The City operates the GAC-4 facility within the Drinking Water Criteria established in Section 2.2. The facility is operated on a continuous pumping schedule as directed by the United States Environmental Protection Agency and the Minnesota Pollution Control Agency. The system is operated in a series of two sets of two GAC vessels. The lead units are referred to in the sample analysis as GAC-SLP4TLE. Samples are taken at the effluent of the lead vessels for operational purposes. When the sample results of the lead vessels exceed the Drinking Water Criteria the GAC is changed out.

The results of the facility effluent are included in Table 3 of this report.

The GAC-4 facility treated 447.973 million gallons of water in 1998. The annual monthly pumpages are shown in Table 4.

CITY OF ST. LOUIS PARK GRANUALAR ACTIVATED CARBON TREATMENT PLANT GAC 1

1998 PRODUCTION

January	35.910
February	11.714
March	19.637
April	21.466
May .	27.911
June	17.606
July	37.220
August	36.262
September	34.199
October	26.185
November	31.795
December	37.697
TOTAL ANNUAL PUMPAGE	337.602

1998 Sampling Plan GAC Treatment System Monitoring Schedule

RAP Section	Sampling Points	Start of Monitoring	Sample Frequency	Analyses
4.3.1(C)	Treated Water (TRTD)	Date of plan approval	Quarterly	PAH (ppt)
4.3.3(D)	Feed Water (FEED)	Date of plan approval	Annually	PAH (ppt)
4.3.4	Treated Water	Date of plan approval	Annually	Extended PAh (ppt)
4.3.4	Treated or Feed Water	Date of plan approval	Annually	Acid Fraction compounds in EPA Test Method 625

All PAH samples are of the extended list

GAC PLANT		SLP4T	SLP4T	SLP4T	SLP4T		SLP10T	SLP10T	SLP10T	SLP10T
DATE		2/10/98	4/28/98	9/28/98	11/3/98		2/10/98	4/28/98	9/28/98	11/3/98
2,3-Benzofuran									-	
2,3-Dihydroindene			·· · · · · · · · · · · · · · · · · · ·	11	20		N	20	1	2
1H-Indene		<u> </u>			1		0			
Naphthalene				1	3		T	· · · · · · · · ·	2	2
Benzo (b) Thiophene				•	3	-	<u> </u>	2	_	
1H-Indole					. 1	-				
2-Methylnaphthalene			-	2	3		Α		1	2
1-Methylnaphthalene				1	2		V		1	1
Biphenyl				·	20		Ā		•	6
Acenaphthylene			· · ·		1		- /\	6		1
Acenaphthene				11	20	_	Ĺ	28	3	6
Dibenzofuran	-	1		<u></u>	1	_	A	1	1	1
Fluorene	-	1			1	-	В	8	2	4
Dibenzothiophene ·					1		L	1		1
Phenanthrene		6	2	-3	6		Ē	2	3	4
Anthracene	-	<u> </u>			1	-	<u> </u>		3	1
Acridine	<u> </u>				3					3
Carbazole				2	3					
Fluoranthene	<u> </u>			2	3	-		2	-	
	-	3		1	3		· ·	3 5	2	3
Pyrene	-	. 3		· · · · · · · · · · · · · · · · · · ·	3	-		5		<u>_</u>
12-Dimethylbenz(a)anthracene	ļ		_			-				
Benzo (e) Pyrene	\vdash									
Perylene	-							·		
3-Methylcholanthrene						<u> </u>				
Dibenz (A,C) Anthracene						-				
Quinoline	С	0	0	0	2	-		0	0	1
Benzo (a) Anthracene	С	0	0	0	0			0	0	0
Chrysene	С	0	0	0	0			0	0	0
Benzo (b) Fluoranthene	С	0	0	0	0			.0	0	0
Benzo (k) Fluoranthene	С	0	0	0	0			.0	0	0
Benzo (a) Pyrene	С	0	0	0	0			0	0	0
Indino (1,2,3-cd) Pyrene	C	0	0	0	0			0	0	0
Dibenz (a,h) Anthracene	С	0	0	0	0			0	0	0
Benzo (g,h,i) Perylene	С	0	0	0	0			0	0	0
TOTAL OTHER PAH		15	2	34	96	l		76	17	40
BENO(a)PYRENE + DIBENZO(A,H)	С	0	0	0	0			0	0	0
TOTAL CARCINOGEN	С	0	0	0	2	-		0	0	1
TOTAL PAH		15	2	34	98	T		76	17	41
Dilution Factor		1	1	1	1			1	1	1
Surrogate Recoveries	1					†				
Naphthalene-d8		94	60	34	47			46	32	35
	+	91	77	58	86	+	 	59	61	79
Fluorene-d10	1	91	(((1 30	1 00	1	ſ	1 33	1 01	10

GAC PLANT	GAC FEED	SLP4F	SLP10F
DATE		4/28/98	4/28/98
2,3-Benzofuran			
2,3-Dihydroindene		160	290
1H-Indene		7	12
Naphthalene			
Benzo (b) Thiophene		27	50
1H-Indole			
2-Methylnaphthalene			
1-Methylnaphthalene			
Biphenyl			
Acenaphthylene			130
Acenaphthene		160	590
Dibenzofuran			34
Fluorene			200
Dibenzothiophene			29
Phenanthrene	1		
Anthracene			
Acridine			
Carbazole		22	
Fluoranthene			47
Pyrene		10	79
12-Dimethylbenz(a)anthracene			
Benzo (e) Pyrene			
Perylene			
3-Methylcholanthrene			
Dibenz (A,C) Anthracene			
Quinoline			
Benzo (a) Anthracene			
Chrysene			
Benzo (b) Fluoranthene			
Benzo (k) Fluoranthene			
Benzo (a) Pyrene			
Indino (1,2,3-cd) Pyrene			
Dibenz (a,h) Anthracene			
Benzo (g,h,i) Perylene			
TOTAL OTHER PAH		386	1461
BENO(a)PYRENE + DIBENZO(A,H)		0	0
TOTAL CARCINOGEN		0	0
TOTAL PAH		386	1461
Dilution Factor		4	10
Surrogate Recoveries			<u> </u>
Naphthalene-d8		69	NC
Fluorene-d10		69	NC
Chrysene-d12		56	NC

CITY OF ST. LOUIS PARK GRANUALAR ACTIVATED CARBON TREATMENT PLANT GAC 4

1998 PRODUCTION

January	42.317
February	19.915
March	24.964
April	23.324
May	40.854
June	41.775
July	43.693
August	38.873
September	44.787
October	43.057
November	41.635
December	42.779
TOTAL ANNUAL PUMPAGE	447.973

SECOND QUARTER MONITORING



Quanterra Incorporated 4955 Yarrow Street Arvada, Colorado 80002

303 421-6611 Telephone 303 431-7171 Fax

April 28, 1998

Mr. Scott E. Anderson
Superintendent of Utilities
City of St. Louis Park
3752 Wooddale Ave.
St. Louis Park, MN 55416-2216

Dear Scott:

Enclosed is the report for 3 aqueous samples received at Quanterra Environmental Services, Denver on February 11, 1998. Included with the report is a quality control summary. Please call if you have any questions.

Sincerely,

Lindsay Breyer Program Manager

Enclosures

Quanterra #059068



FOR
CITY OF ST. LOUIS PARK
QUANTERRA NO. 059068
APRIL 28, 1998

Prepared by:

Lindsay/Breyer



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Supporting Documentation [Please Note: A one-page "Description of Suppo Documentation section(s).]	rting Documentation" is pro	ovided in the Supporting
Volatile GC/MS	В	
Semivolatile GC/MS	C	55]
Volatile GC	D	
Semivolatile GC	E	
LC/MS or HPLC	F	
Metals	G	
General Chemistry	H	
Subcontracted Data	I	



NARRATIVE

On February 11, 1998, Quanterra Environmental Services, Denver received 3 aqueous samples from the City of St. Louis Park.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data.

General Comments

Dilution factors listed on the data sheets for the aqueous semivolatile organic parameters are based on the volume of sample actually extracted relative to the nominal volume of 1.0 liter. Any additional dilutions performed on the samples after extraction are also included in the dilution factor. All results and reporting limits are adjusted relative to the sample volume extracted and any subsequent dilutions performed. Dilution factors are rounded to two significant figures for reporting; all calculations are performed before rounding.

GC/MS Semivolatile Organics

In the initial analysis of the samples, several analytes were detected above the reporting limit in the method blank. The concentration of phenanthrene exceeded the limits for the method blank specified in the 1998 Sampling Plan. In addition, the recoveries of fluorene in the LCS and quinoline and flurene matrix spike/matrix spike duplicate also exceeded control limits. Benzo(e)pyrene was not recovered in the matrix spike/matrix spike duplicate; matrix interference is suspected. The samples were therefore reextracted and re-analyzed. New samples were logged (059068-0011 through -0013) so that both sets of data could be reported. Since only 2 liteers of each sample remained for analysis, the final extract volumes were reduced by half and spike amounts were adjusted in order to compensate. The reextraction took place after the holding time had expired.

In the second analysis, the method blank and LCS were within control limits for all compounds. Recoveries of all compounds except benzo(e)pyrene were within control limits for the matrix spike and matrix spike duplicate. The RPD for chrysene was slightly outside control limits. Matrix effects are suspected.



With the exceptions noted above, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory QC samples analyzed in conjunction with the samples in this project were within established control limits.



SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Quanterra's Denver laboratory is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date Time	Received Date
059068-0001-FB 059068-0002-SA 059068-0003-SA 059068-0003-FD 059068-0003-MS 059068-0003-SD 059068-0011-FB 059068-0011-FD 059068-0012-SA 059068-0013-SA	GAC-SLP4TFB-021098 GAC-SLP4TFBD-021098 GAC-SLP4TLE-021098 GAC-SLP4TD-021098 GAC-SLP4TD-021098 GAC-SLP4TMS-021098 GAC-SLP4TMSD-021098 GAC-SLP4TFB-021098 GAC-SLP4TFBD-021098 GAC-SLP4TFBD-021098 GAC-SLP4TLE-021098 GAC-SLP4T-021098	AQUEOUS	10 FEB 98 10 FEB 98	11 FEB 98 11 FEB 98
059068-0013-FD 059068-0013-MS 059068-0013-SD	GAC-SLP4TD-021098 GAC-SLP4TMS-021098 GAC-SLP4TMSD-021098	AQUEOUS AQUEOUS AQUEOUS	10 FEB 98 10 FEB 98 10 FEB 98	11 FEB 98 11 FEB 98 11 FEB 98



ANALYTICAL TEST REQUESTS for City of St. Louis Park

Page 1 of 1

Lab ID:	Group	Analysis Description	Custom
059068	Code		Test?
0001 - 0003,	A	Polynuclear Aromatic Hydrocarbons	N
0003		Prep - PAH Semivolatile Organics by GC/MS, 5	N
0001	В	Polynuclear Aromatic Hydrocarbons Prep - PAH Semivolatile Organics by GC/MS, 5	N N
0011 . 0011. 0012 - 0013. 0013	С	Polynuclear Aromatic Hydrocarbons Prep - PAH Semivolatile Organics by GC/MS, 5	N N



ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization date is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Quanterra reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Quanterra does not routinely blank-correct analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method.



Client Name: City of St. Louis Park Client ID: GAC-SLP4TFB-021098

059068-0001-FB Lab ID:

Prepared: 16 FEB 98 Analyzed: 03 MAR 98 Sampled: 10 FEB 98 Received: 11 FEB 98 AQUEOUS Matrix: Authorized: 11 FEB 98

Parameter	Result	Units	Reporting Limit	
2,3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(a)pyrene Benzo(a)pyrene Perylene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	ND N	ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L	4.8 4.7 0.85 6.85 6.5 2.7 4.1 1.2 0.95 1.0 2.1 2.1 2.2 2.2 2.1 2.7 4.1 2.7 2.7 4.1 2.7 2.7 2.7 4.1 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7 2.7	B B B
Surrogate	·			
Naphthalene-d8 Fluorene-d10 Chrysene-d12	91 90 64	% %	21-108 41-162 10-118	

All results and limits are corrected for dilution. Dilution factor is 0.95.

 $\mbox{\bf B} = \mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf ND} = \mbox{\bf Not}$ Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park Client ID: GAC-SLP4TFBD-021098 Lab ID: 059068-0001-FD

Prepared: 16 FEB 98 Analyzed: 03 MAR 98 Sampled: 10 FEB 98 Received: 11 FEB 98 AQUEOUS Matrix: Authorized: 11 FEB 98

Parameter	Result	Units	Reporting Limit	
Parameter 2,3-Benzofuran 2,3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(e)pyrene Benzo(a)pyrene Benzo(a)pyrene Perylene	Result ND	ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L	4.8 4.7 0.85 6.1 0.85 6.5 2.4 3.7 2.6 4.1 1.2 0.95 1.2 2.8 2.9 2.4	В
Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	ND ND ND	ng/L ng/L ng/L	2.0 1.5 2.6	
Surrogate	Recovery		Limits	
Naphthalene-d8 Fluorene-d10 Chrysene-d12	95 90 64	* *	21-108 41-162 10-118	

All results and limits are corrected for dilution. Dilution factor is 0.95.

 $\mbox{\bf B} = \mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf ND} = \mbox{\bf Not}$ Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park
Client ID: GAC-SLP4TLE-021098
Lab ID: 059068-0002-SA
Matrix: AQUEOUS

Prepared: 16 FEB 98 Analyzed: 03 MAR 98 Sampled: 10 FEB 98 Received: 11 FEB 98 Authorized: 11 FEB 98

Parameter	Result	Units	Reporting Limit	
2,3-Benzofuran	ND	ng/L	5.0	
2,3-Dihydroindene	25	ng/L	4.9	
Indene	2.1	ng/L	0.88	
Naphthalene	ND	ng/L	6.3	
Benzo(b)thiophene	ND	ng/L	0.88	
Quinoline	ND	ng/L	6.7	
1H-Indole	ND	ng/L	2.4	
2-Methylnaphthalene	ND	ng/L	3.8	
1-Methylnaphthalene	ND	ng/L	2.7	
Biphenyl	ND	ng/L	4.2	
Acenaphthylene	ND 27	ng/L	1.4	
Acenaphthene	27 ND	ng/L	1.3 0.98	
Dibenzofuran	ND	ng/L ng/L	0.98	
Fluorene Dibenzothiophene	ND	ng/L	1.1	•
Phenanthrene	3.2	ng/L	1.3	В
Anthracene	ND.	ng/L	2.6	D
Acridine	ND	ng/L	6.0	
Carbazole	3.2	ng/L	1.9	
Fluoranthene	3.3	ng/L	3.0	R
Pyrene	2.4	ng/L	1.4	B B
Benzo(a)anthracene	ND.	ng/L	2.4	
Chrysene	ND	ng/L	2.7	
Benzo(b)fluoranthene	ND	ng/L	2.4	-
Benzo(k)fluoranthene	ND	ng/L	2.2	•
Benzo(e)pyrene	ND	ng/L	1.9	
Benzo(a)pyrene	ND	ng/L	2.2	
Perylene	ND	ng/L	2.4	
Indeno(1,2,3-cd)pyrene	ND	ng/L	2.0	
Dibenz(a,h)anthracene	ND	ng/L	1.6	
Benzo(g,h,i)perylene	ND	ng/L	2.7	
Surrogate	Recovery		Limits	
Naphthalene-d8	91	*	21-108	
Fluorene-d10	89	% %	41-162	
Chrysene-d12	35	X	10-118	

Dilution factor is 0.98. All results and limits are corrected for dilution.

 $\mbox{\bf B} = \mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf ND} = \mbox{\bf Not}$ Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park

Client ID: GAC

GAC-SLP4T-021098

Lab ID:

059068-0003-SA

Matrix:

AQUEOUS

Authorized: 11 FEB 98

Sampled: 10 FEB 98 Received: 11 FEB 98

Prepared: 16 FEB 98 Analyzed: 03 MAR 98

Reporting Result Units Limit Parameter 2,3-Benzofuran ND ng/L 4.8 2,3-Dihydroindene ND 4.7 ng/L ng/L ND 0.85 Indene ND Naphthalene ng/L 6.2 Benzo(b)thiophene ND ng/L 0.85 ng/L Quinoline ND 6.5 2.4 1H-Indole ND ng/L 2-Methylnaphthalene 1-Methylnaphthalene 3.7 ND ng/L 2.7 ND ng/L 4.1 Biphenyl ND ng/L Acenaphthylene ND 1.3 ng/L Acenaphthene 1.2 ND ng/L 1.0 0.95 Dibenzofuran ng/L Fluorene 0.95 1.0 ng/L В 1.0 Dibenzothiophene ND ng/L 1.2 В Phenanthrene 5.7 ng/L 2.6 5.8 ND Anthracene ng/L Acridine ND ng/L 1.8 Carbazole ND ng/L 2.9 Fluoranthene 3.6 ng/L В 2.5 ng/L 1.3 В Pyrene 2.4 Benzo(a)anthracene ND ng/L Chrysene ND ng/L Benzo(b) fluoranthene ND ng/L 2.4 Benzo(k)fluoranthene ND ng/L 2.2 Benzo(e)pyrene ND ng/L 1.8 2.2 2.4 ND ng/L Benzo(a)pyrene ND ng/L Perylene Indeno(1,2,3-cd)pyrene ND ng/L 2.0 Dibenz(a,h)anthracene ND 1.5 ng/L ND ng/L Benzo(g,h,i)perylene Surrogate Recovery Limits Naphthalene-d8 94 21-108 X Fluorene-d10 91 41-162 Chrysene-d12 31 10-118

Dilution factor is 0.95. All results and limits are corrected for dilution.

B = Compound is also detected in the blank.

ND = Not Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park Client ID: GAC-SLP4TD-021098

059068-0003-FD Lab ID:

Sampled: 10 FEB 98 Received: 11 FEB 98 Prepared: 16 FEB 98 Analyzed: 03 MAR 98 Matrix: **AQUEOUS** Authorized: 11 FEB 98

Parameter	Result	Units	Reporting Limit	
2,3-Benzofuran 2,3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(c)pyrene Benzo(a)pyrene Perylene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	ND N	ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L	4.8 4.8 0.86 6.2 0.6 2.4 7 2.7 4.1 1.2 0.95 1.0 2.5 1.2 2.2 2.1 2.2 2.4 2.5 2.7 Limits	B B B
Surrogate	Recovery		Limits	
Naphthalene-d8 Fluorene-d10 Chrysene-d12	89 85 32	% % %	21-108 41-162 10-118	

Dilution factor is 0.95. All results and limits are corrected for dilution.

 $\mbox{\bf B} = \mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf ND} = \mbox{\bf Not}$ Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park Client ID: GAC-SLP4TFB-021098 Undb ID: 059068-0011-FB

Matrix: AQUEOUS Sampled: 10 FEB 98 Prepared: 14 APR 98 Authorized: 11 FEB 98 Received: 11 FEB 98 Analyzed: 22 APR 98

			·
Parameter	Result	Units	Reporting Limit
2,3-Benzofuran	ND	ng/L	5.1
2.3-Dihydroindene	ND	ng/L	5.0
Indene	ND	ng/L	0.90
Naphthalene	ND	ng/L	6.5
Benzo(b)thiophene	ND	ng/L	0.90
Quinoline	ND	ng/L	6.9
1H-Indole	ND	ng/L	2.5
2-Methylnaphthalene	ND	ng/L	3.9
1-Methylnaphthalene	ND	ng/L	2.8
Biphenyl	ND	ng/L	4.3
Acenaphthylene	ND	ng/L	1.4
Acenaphthene	ND	ng/L	1.3
Dibenzofuran	ND	ng/L	1.0
Fluorene	ND	ng/L	1.0
Dibenzothiophene	ND	ng/L	1.1
Phenanthrene	ND	ng/L	1.3
Anthracene	ND	ng/L	2.7
Acridine	ND	ng/L	6.1
Carbazole	ND	ng/L	1.9
Fluoranthene	ND	ng/L	3.1
Pyrene	ND	ng/L	1.4
Benzo(a)anthracene	ND	ng/L	2.5 2.8
Chrysene	ND	ng/L	2.8
Benzo(b)fluoranthene	ND	ng/L	2.5
Benzo(k)fluoranthene	ND	ng/L	2.3
Benzo(e)pyrene	ND	ng/L	1.9 2.3
Benzo(a)pyrene	ND	ng/L	2.3
Perylene Perylene	ND	ng/L	2.5 2.1
Indeno(1,2,3-cd)pyrene	ND ND	ng/L	1.6
Dibenz(a,h)anthracene		ng/L	2.8
Benzo(g,h,i)perylene	ND	ng/L	2,0
Surrogate	Recovery	,	Limits
Naphthalene-d8	80	*	21-108
Fluorene-d10	64	* * *	41-162
Chrysene-d12	57	*	10-118
OIII Joone ATE	.	••	

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser Approved By: Audrey Cornell



Client Name: City of St. Louis Park Client ID: GAC-SLP4TFBD-021098 Lab ID: 059068-0011-FD

Prepared: 14 APR 98 Analyzed: 22 APR 98 Sampled: 10 FEB 98 Received: 11 FEB 98 AQUEOUS Matrix: Authorized: 11 FEB 98

Parameter	Result	Units	Reporting Limit
Parameter 2,3-Benzofuran 2,3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(e)pyrene Benzo(a)pyrene	Result ND	Units ng/L ng/L	
Perylene	ND	ng/L	2.4
Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene	ND ND	ng/L ng/L	2.0 1.5
Benzo(g,h,i)perylene	ND	ng/L	2.7
Surrogate	Recovery		Limits
Naphthalene-d8 Fluorene-d10 Chrysene-d12	79 64 59	* *	21-108 41-162 10-118

Dilution factor is 0.95. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser Approved By: Audrey Cornell



Client Name: City of St. Louis Park Client ID: GAC-SLP4TLE-021098

059068-0012-SA Lab ID:

Prepared: 14 APR 98 Analyzed: 22 APR 98 Sampled: 10 FEB 98 Received: 11 FEB 98 AQUEOUS Matrix: Authorized: 11 FEB 98

Parameter	Result	Units	Reporting Limit	
2,3-Benzofuran 2,3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(c)pyrene Benzo(a)pyrene Perylene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	ND 34 1.8 ND 4.4 ND	ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L	4.9 4.8 0.87 6.3 0.87 6.7 2.4 3.8 2.7 4.2 1.4 1.3 0.97 0.97 1.1 1.3 2.6 5.9 1.8 3.0 1.4 2.4 2.7 2.4 2.7 2.4 2.2 1.8 2.7	В
Surrogate	Recovery		Limits	
Naphthalene-d8 Fluorene-d10 Chrysene-d12	76 62 33	* * *	21-108 41-162 10-118	

All results and limits are corrected for dilution. Dilution factor is 0.97.

 $\mbox{\bf B} = \mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf ND} = \mbox{\bf Not}$ Detected

Reported By: Lisa Burgesser



Client Name: City of St. Louis Park Client ID: GAC-SLP4T-021098

Lab ID:

059068-0013-SA Sampled: 10 FEB 98 Received: 11 FEB 98 Prepared: 14 APR 98 Analyzed: 22 APR 98 Matrix: AQUEOUS Authorized: 11 FEB 98

Parameter	Result	Units	Reporting Limit
2,3-Benzofuran	ND	ng/L	4.8
2,3-Dihydroindene	ND	ng/L	4.7
Indene	ND	ng/L	0.85
Naphthalene .	ND	ng/L	6.2
Benzo(b)thiophene	ND	ng/L	0.85
Quinoline	ND	ng/L	6.5
1H-Indole	ND	ng/L	2.4
2-Methylnaphthalene	ND	ng/L	3.7
1-Methylnaphthalene	ND	ng/L	2.7
Biphenyl	ND	ng/L	4.1
Acenaphthylene	ND	ng/L	1.3
Acenaphthene	ND	ng/L	1.2
Dibenzofuran	ND	ng/L	0.95
Fluorene	ND	ng/L	0.95
Dibenzothiophene	ND	ng/L	1.0
Phenanthrene	ND	ng/L	1.2
Anthracene	ND	ng/L	2.6
Acridine	ND	ng/L	5.8
Carbazole	ND	ng/L	1.8
Fluoranthene	ND	ng/L	2.9
Pyrene	ND	ng/L	1.3
Benzo(a)anthracene	ND	ng/L	2.4
Chrysene	ND	ng/L	2.7
Benzo(b)fluoranthene	ND	ng/L	2.4
Benzo(k)fluoranthene	ND	ng/L	2.2
Benzo(e)pyrene	ND	ng/L	1.8
Benzo(a)pyrene	ND	ng/L	2.2
Perylene	ND	ng/L	2.4
Indeno(1,2,3-cd)pyrene	ND	ng/L	2.0
Dibenz(a,h)anthracene	ND	ng/L	1.5
Benzo(g,h,i)perylene	ND	ng/L	2.7
Surrogate	Recovery		Limits
Naphthalene-d8	81	*	21-108
Fluorene-d10	64	*	41 - 162
Chrysene-d12	33	*	10-118

Dilution factor is 0.95. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser Approved By: Audrey Cornell



Client Name: City of St. Louis Park Client ID: GAC-SLP4TD-021098

059068-0013-FD Lab ID:

Sampled: 10 FEB 98 Received: 11 FEB 98 Prepared: 14 APR 98 Analyzed: 22 APR 98 AQUEOUS Matrix: Authorized: 11 FEB 98

Parameter	Result	Units	Reporting Limit
2,3-Benzofuran	ND	ng/L	5.4
2,3-Dihydroindene	ND	ng/L	5.3
Indene	ND	ng/L	0.95
Naphthalene	ND	ng/L	6.8
Benzo(b)thiophene	ND	ng/L	0.95
Quinoline	ND	ng/L	7.3
1H-Indole	ND	ng/L	2.6
2-Methylnaphthalene	ND	ng/L	4.1
1-Methylnaphthalene	ND	ng/L	2.9
Biphenyl	ND	ng/L	4.5
Acenaphthylene	ND	ng/L	1.5
Acenaphthy rene Acenaphthene	ND	ng/L	1.4
Dibenzofuran	ND	ng/L	1.1
Fluorene	ND	ng/L	1.1
Dibenzothiophene	ND	ng/L	1.2
Phenanthrene	· ND	ng/L	1.4
Anthracene	ND	ng/L	2.8
Acridine	ND	ng/L	6.4
Carbazole	ND	ng/L	2.0
Fluoranthene	ND	nǧ/L	3.3
Pyrene	ND	ng/L	1.5
Benzo(a)anthracene	ND	ng/L	2.6
Chrysene	ND	ng/L	2.9
Benzo(b)fluoranthene	ND	ng/L	2.6
Benzo(k)fluoranthene	ND .	ng/L	2.4
Benzo(e)pyrene	ND	ng/L	2.0
Benzo(a)pyrene	ND	ng/L	2.4
Perylene	ND	ng/L	2.6
Indeno(1,2,3-cd)pyrene	ND	ng/L	2.2
Dibenz(a,h)anthracene	ND	ng/L	1.7
Benzo(g,h,i)perylene	ND	ng/L	2.9
Surrogate	Recovery		Limits
Naphthalene-d8	78	*	21-108
Fluorene-d10	61	% % %	41-162
Chrysene-d12	22	X	10-118

All results and limits are corrected for dilution. Dilution factor is 1.1.

ND = Not Detected

Approved By: Audrey Cornell Reported By: Lisa Burgesser



QC SUMMARY

The Quanterra laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

- 1. establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data,
- 2. assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix,
- 3. establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and
- 4. provide a standard set of reportables which assures the client of the quality of his data.

The Quanterra QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.



Quanterra Incorporated 4955 Yarrow Street Arvada, Colorado 80002

303 421-6611 Telephone 303 431-7171 Fax

June 2, 1998

Mr. Scott E. Anderson
Superintendent of Utilities
City of St. Louis Park
3752 Wooddale Ave.
St. Louis Park, MN 55416-2216

Dear Scott:

Enclosed is the report for 11 aqueous samples received at Quanterra Environmental Services, Denver on April 29, 1998. Included with the report is a quality control summary. Please call if you have any questions.

Sincerely,

Kurt C. Ill

Technology Manager

Enclosures

Quanterra #0060158

ANALYTICAL RESULTS FOR CITY OF ST. LOUIS PARK QUANTERRA NO. 060158

June 2, 1998

Prepared by:

Kurt C. III



NARRATIVE

On April 29, 1998, Quanterra Environmental Services, Denver received 11 aqueous samples from the City of St. Louis Park.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data.

General Comments

Dilution factors listed on the data sheets for the aqueous semivolatile organic parameters are based on the volume of sample actually extracted relative to the nominal volume of 1.0 liter. Any additional dilutions performed on the samples after extraction are also included in the dilution factor. All results and reporting limits are adjusted relative to the sample volume extracted and any subsequent dilutions performed. Dilution factors are rounded to two significant figures for reporting; all calculations are performed before rounding.

GC/MS Semivolatile Organics

Client samples with laboratory Ids 060158-0001SA, -0002SA and -0003SA were analyzed at a dilution due to target analytes exceeding the linear range of the instrument. The reporting limits were raised accordingly. As a result of dilution, the surrogate compounds associated with sample 060158-0002SA were not detected and are reported as "NC", not calculated.

The spike compound Fluorene is reported at 265% and 319% recovery in the matrix spike and matrix spike duplicate samples which is outside the 69% to 118 % historical limits. Fluorene was spiked a less than 3 to 5 times the concentration of the sample. A matrix effect is indicated. With the exceptions noted above, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory QC samples analyzed in conjunction with the samples in this project were within established control limits.



LIMs Report Key

Section	Description
Cover Letter	Signature page, report narrative as applicable.
Sample Description Information	Tabulated cross-reference between the Lab ID and Client ID, including matrix, date and time sampled, and the date received for all samples in the project.
Sample Analysis Results Sheets	Lists sample results, test components, reporting limits, dates prepared and analyzed, and any data qualifiers. Pages are organized by test.
QC LOT Assignment Report	Cross-reference between lab IDs and applicable QC batches (DCS, LCS, Blank, MS/SD, DU)
Duplicate Control Sample Report	Percent recovery and RPD results, with acceptance limits, for the laboratory duplicate control samples for each test are tabulated in this report. These are measures of accuracy and precision for each test. Acceptance limits are based upon laboratory historical data.
Laboratory Control Sample Report	Percent recovery results for a single Laboratory Control Sample (if applicable) are tabulated in this report, with the applicable acceptance limits for each test.
Matrix Spike/Matrix Spike Duplicate Report	Percent recovery and RPD results for matrix- specific QC samples and acceptance limits, where applicable. This report can be used to assess matrix effects on an analysis.
Single Control Sample Report	A tabulation of the surrogate recoveries for the blank for organic analyses.
Method Blank Report	A summary of the results of the analysis of the method blank for each test.

List of Abbreviations and Terms

Abbreviation	Term	Abbreviation	Term
DCS	Duplicate Control Sample	MSD	Matrix Spike Duplicate
DU	Sample Duplicate	QC Run	Preparation Batch
EB	Equipment Blank	QC Category	LIMs QC Category
FB	Field Blank	QC Lot	DCS Batch
FD	Field Duplicate	ND	Not Detected at or above the reporting limit expressed
IDL	Instrument Detection Limit (Metals)	QC Matrix	Matrix of the laboratory control sample(s)
LCS	Laboratory Control Sample	RL	Reporting Limit
MB	Method Blank	QC	Quality Control
MDL	Method Detection Limit	SA	Sample
MS	Matrix Spike	SD	Spike Duplicate
RPD	Relative Percent Difference	TB	Trip Blank
ppm (part-per- million)	mg/L or mg/kg (usually)	ppb (part-per- billion)	ug/L or ug/kg (usually)
QUAL	Qualifier flag	DIL	Dilution Factor



SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Quanterra's Denver laboratory is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date Time	Received Date
060158-0001-SA 060158-0002-SA 060158-0003-SA 060158-0004-SA 060158-0006-SA 060158-0006-DU 060158-0006-MS 060158-0006-FB 060158-0006-FB	PCJ-SLP4F-042898 PCJ-SLP10F-042898 PCJ-SLP4T-042898 PCJ-SLP4T-042898 PCJ-SLP4LE-042898 PCJ-SLP10TT-042898 PCJ-SLP10TD-042898 PCJ-SLP10TMS-042898 PCJ-SLP10TMSD-042898 PCJ-SLP10TFB-042898	AQUEOUS	28 APR 98	29 APR 98 29 APR 98



ANALYTICAL TEST REQUESTS for City of St. Louis Park

Page 1 of 1

Lab ID:	Group	Analysis Description	Custom
060158	Code		Test?
0001 - 0006. 0006 , 0006	Α	Polynuclear Aromatic Hydrocarbons Prep - PAH Semivolatile Organics by GC/MS, 5	



ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization date is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Quanterra reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Quanterra does not routinely blank-correct analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method.



Client Name: City of St. Louis Park Client ID: PCJ-SLP10F-042898 Lab ID: 060158-0002-SA

Matrix: AQUEOUS Authorized: 29 APR 98 Sampled: 28 APR 98 Received: 29 APR 98 Prepared: 03 MAY 98 Analyzed: 22 MAY 98

Parameter	Result	Units	Reporting Limit	
2,3-Benzofuran 2,3-Dihydroindene	ND 290	ng/L ng/L	48 47	
Indene Naphthalene	12 ND	ng/L ng/L	8.5 62	
Benzo(b)thiophene	50	ng/L	8.5	
Quinoline	ND	ng/L	65	
1H-Indole	ND	ng/L	24	
2-Methylnaphthalene	ND ND	ng/L	37	
1-Methylnaphthalene Biphenyl	ND ND	ng/L ng/L	27 41	
Acenaphthylene	130	ng/L	13	
Acenaphthene	590	ng/L	12	
Dibenzofuran	34	ng/L	9.5	В
Fluorene	200	ng/L	9.5	В
Dibenzothiophene	29 NB	ng/L	10	В
Phenanthrene Anthracene	ND ND	ng/L	12 26	
Anthracene / Acridine	ND ND	ng/L ng/L	58	
Carbazole	ND	ng/L	18	
Fluoranthene	47	ng/L	29	В
Pyrene	79	ng/L	13	В
Benzo(a)anthracene	ND	ng/L	24	
Chrysene	ND	ng/L	27	
Benzo(b)fluoranthene Benzo(k)fluoranthene	ND ND	ng/L	24 22	
Benzo(e)pyrene	ND	ng/L ng/L	18	
Benzo(a)pyrene	ND	ng/L	22	
Perylene	ND	ng/L	24	
Indeno(1,2,3-cd)pyrene	ND	ng/L	20	
Dibenz(a,h)anthracene	ND	ng/L	15	
Benzo(g,h,i)perylene	ND	ng/L	27	
Surrogate	Recovery		Limits	
Naphthalene-d8	NC	*	21-108	
Fluorene-d10	NC	* *	41-162	
Chrysene-d12	NC	* %	10-118	

Dilution factor is 9.5. All results and limits are corrected for dilution.

B = Compound is also detected in the blank. NC = Not Calculated, calculation not applicable.

ND = Not Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park Client ID: PCJ-SLP4-042898 Lab ID: 060158-0003-SA

Matrix:

AQUEOUS

Authorized: 29 APR 98

Sampled: 28 APR 98 Received: 29 APR 98

Prepared: 03 MAY 98 Analyzed: 22 MAY 98

Parameter	Result	Units	Reporting Limit	
2,3-Benzofuran	ND	ng/L	20	
2.3-Dihydroindene	160	ng/L	19	
Indene	8.6	ng/L	3.5	
Naphthalene	. ND	ng/L	25	
Benzo(b)thiophene	27	ng/L	3.5	
Quinoline	ND	ng/L	27	
1H-Indole	ND	ng/L	9.6	
2-Methylnaphthalene	ND	ng/L	15	
1-Methylnaphthalene	ND	ng/L	11	
Biphenyl	ND	ng/L	17	
Acenaphthylene	ND	ng/L	5.4	
Acenaphthene	190	ng/L	5.0	
Dibenzofuran	ND	ng/L	3.8	
Fluorene	ND	ng/L	3.8	
Dibenzothiophene	ND	ng/L	4.2	
Phenanthrene	ND	ng/L	5.0	
Anthracene	ND	ng/L	10	
Acridine Carbazole	ND 26	ng/L	23 7.3	
Fluoranthene	15	ng/L	7.3 12	В
	13	ng/L ng/L	5.4	В
Pyrene Benzo(a)anthracene	ND	ng/L ng/L	9.6	В
Chrysene	ND ND		9.6 11	
Benzo(b)fluoranthene	ND ND	ng/L ng/L	9.6	
Benzo(k) fluoranthene	ND ND	ng/L	8.8	
Benzo(e)pyrene	ND ND	ng/L	7.3	
Benzo(a)pyrene	ND	ng/L	7.3 8.8	
Perylene	ND	ng/L	9.6	
Indeno(1,2,3-cd)pyrene	ND	ng/L	8.1	
Dibenz(a,h)anthracene	ND	ng/L	6.2	
Benzo(g,h,i)perylene	ND	ng/L	11	
benzo(g,n, r)per grene	NO	iig/ L		
Surrogate	Recovery		Limits	
Naphthalene-d8	71	*	21-108	
Fluorene-d10	78	* * *	41-162	
Chrysene-d12	48	ž	10-118	
		-		

Dilution factor is 3.8. All results and limits are corrected for dilution.

 $\mbox{\bf B}$ = Compound is also detected in the blank. $\mbox{\bf ND}$ = Not Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park Client ID: PCJ-SLP10T-042898

Lab ID: 060158-0006-SA

Sampled: 28 APR 98 Received: 29 APR 98 Prepared: 03 MAY 98 Analyzed: 19 MAY 98 Matrix: AQUEOUS Authorized: 29 APR 98

Parameter	Result	Units	Reporting Limit	
2,3-Benzofuran 2,3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline IH-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(c)pyrene Benzo(a)pyrene Perylene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	ND 20 ND ND 2.3 ND ND ND 5.6 28 1.4 7.6 2.1 ND ND ND ND ND ND ND ND ND ND ND ND ND	ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L	4.8 4.8 0.86 6.2 0.86 6.6 2.4 3.7 2.7 4.1 1.2 0.95 1.0 1.2 2.6 5.8 1.8 2.9 1.3 2.4 2.7 2.4 2.2 2.4 2.7	B B B B B
Surrogate	Recovery		Limits	
Naphthalene-d8 Fluorene-d10 Chrysene-d12	46 59 44	% % %	21-108 41-162 10-118	

Dilution factor is 0.95. All results and limits are corrected for dilution.

 $\mbox{\bf B} = \mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf ND} = \mbox{\bf Not}$ Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park Client ID: PCJ-SLP4F-042898 Lab ID: 060158-0001-SA

Sampled: 28 APR 98 Received: 29 APR 98 Prepared: 03 MAY 98 Analyzed: 22 MAY 98 Matrix: **AQUEOUS** Authorized: 29 APR 98

Parameter	Result	Units	Reporting Limit	
Parameter 2,3-Benzofuran 2,3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline IH-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(c)pyrene Benzo(a)pyrene Perylene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	Result ND 160 7.2 ND 27 ND	Units ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/	21 20 3.6 26 3.6 28 10 16 11 17 5.7 5.3 4.1 4.5 5.3 11 25 7.7 13 5.7 10 11 10 9.3 7.7 9.3 10 8.5 6.5	В
Surrogate	Recovery	-	Limits	
Naphthalene-d8 Fluorene-d10 Chrysene-d12	69 69 56	% %	21-108 41-162 10-118	

All results and limits are corrected for dilution. Dilution factor is 4.1.

 $\mbox{\bf B} = \mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf ND} = \mbox{\bf Not}$ Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park Client ID: PCJ-SLP4T-042898

Lab ID:

Matrix:

060158-0004-SA

Authorized: 29 APR 98

AQUEOUS

Prepared: 03 MAY 98 Analyzed: 20 MAY 98

Sampled: 28 APR 98 Received: 29 APR 98

Parameter	Result	Units	Reporting Limit	-
2.3-Benzofuran 2.3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(c)pyrene Benzo(a)pyrene Perylene Indeno(1.2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	ND ND ND ND ND ND ND ND ND ND ND ND ND N	ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L	4.8 4.7 0.85 6.2 0.85 6.5 2.4 3.7 4.1 1.2 0.95 1.0 1.2 6.8 1.8 2.3 2.4 2.4 2.4 2.5 2.7	В
Surrogate	Recovery		Limits	
Naphthalene-d8 Fluorene-d10 Chrysene-d12	60 77 42	% %	21-108 41-162 10-118	

Dilution factor is 0.95. All results and limits are corrected for dilution.

 $\mbox{\bf B} = \mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf ND} = \mbox{\bf Not}$ Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park Client ID: PCJ-SLP4LE-042898 Lab ID: 060158-0005-SA

Prepared: 03 MAY 98 Analyzed: 20 MAY 98 Matrix: AQUEOUS Authorized: 29 APR 98 Sampled: 28 APR 98 Received: 29 APR 98

Parameter	Result	Units	Reporting Limit
2.3-Benzofuran	ND	ng/L	4.8
2,3-Dihydroindene	36	ng/L	4.7
Indene	1.9	ng/L	0.85
Naphthalene	. ND	ng/L	6.2
Benzo(b)thiophene	5.9	ng/L	0.85
Quinoline	ND	ng/L	6.5
1H-Indole	ND	ng/L	2.4
2-Methylnaphthalene	ND	ng/L	3.7
1-Methylnaphthalene	ND	ng/L	2.7
Biphenyl	ND	ng/L	4.1
Acenaphthylene	ND	ng/L	1.3
Acenaphthene	54	ng/L	1.2
Dibenzofuran	ND	ng/L	0.95
Fluorene	ND	ng/L	0.95
Dibenzothiophene	ND _	ng/L	1.0
Phenanthrene	.3.5	ng/L	1.2
Anthracene	ND	ng/L	2.6
Acridine	ND	ng/L	5.8
Carbazole	8.0	ng/L	1.8 2.9
Fluoranthene	5.2	ng/L	2.9
Pyrene	4.6	ng/L	1.3
Benzo(a)anthracene	ND	ng/L	2.4
Chrysene	ND	ng/L	2.7
Benzo(b) fluoranthene	ND	ng/L	2.4
Benzo(k)fluoranthene	ND	ng/L	2.2 1.8
Benzo(e)pyrene	ND	ng/L	1.0
Benzo(a)pyrene	ND	ng/L	2.2 2.4
Perylene	ND	ng/L	2.4
Indeno(1,2,3-cd)pyrene	ND ND	ng/L	2.U 1 E
Dibenz(a,h)anthracene	ND	ng/L	1.5 2.7
Benzo(g,h,i)perylene	ND	ng/L	2.1
Surrogate	Recovery		Limits
Naphthalene-d8	58	x	21-108
Fluorene-d10	71	* *	41-162
Chrysene-d12	55	ž	10-118
5111 J - 511 - 512		-	

All results and limits are corrected for dilution. Dilution factor is 0.95.

ND = Not Detected

Approved By: Mary Helen Kelan Reported By: Tom Claeys



13111

Client Name: City of St. Louis Park Client ID: PCJ-SLP10TD-042898 Lab ID: 060158-0006-DU Matrix: AQUEOUS

Authorized: 29 APR 98

Sampled: 28 APR 98 Received: 29 APR 98

Prepared: 03 MAY 98 Analyzed: 20 MAY 98

Parameter	Result	Units	Reporting Limit
2,3-Benzofuran 2,3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(e)pyrene Benzo(a)pyrene Perylene Indeno(1,2,3-cd)pyrene	ND 38 1.1 ND 4.3 ND	ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L	
Dibenz(a,h)anthracene Benzo(g,h,i)perylene	ND ND	ng/L ng/L	2.7
Surrogate	Recovery		Limits
Naphthalene-d8 Fluorene-d10 Chrysene-d12	70 83 50	% %	21-108 41-162 10-118

Dilution factor is 0.95.

All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Tom Claeys



Client Name: City of St. Louis Park Client ID: PCJ-SLP10TFB-042898 Lab ID: 060158-0006-FB Matrix: AQUEOUS Authorized: 29 APR 98

Sampled: 28 APR 98 Received: 29 APR 98 Prepared: 03 MAY 98 Analyzed: 20 MAY 98

Parameter	Result	Units	Reporting Limit	
2.3-Benzofuran 2.3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(c)pyrene Benzo(a)pyrene Perylene Indeno(1.2.3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene		ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/L	4.9 4.8 6.2 0.86 6.6 2.7 4.1 1.2 0.95 1.0 1.2 2.4 2.4 2.5 2.4 2.5 2.7	В
Surrogate	Recovery		Limits	
Naphthalene-d8 Fluorene-d10 Chrysene-d12	59 76 76	* * *	21-108 41-162 10-118	

Dilution factor is 0.95. All results and limits are corrected for dilution.

B = Compound is also detected in the blank.

ND = Not Detected

Reported By: Tom Claeys



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Client Name: City of St. Louis Park Client ID: PCJ-SLP10TFBD-042898 Lab ID: 060158-0006-FD

Prepared: 03 MAY 98 Analyzed: 20 MAY 98 Sampled: 28 APR 98 Received: 29 APR 98 Matrix: AQUEOUS Authorized: 29 APR 98

Parameter	Result	Units	Reporting Limit	
2.3-Benzofuran	ND	ng/L	4.9	
2,3-Dihydroindene	ND	ng/L	4.8	
Indene	ND	ng/L	0.87	
Naphthalene	. ND	ng/L	6.3	
Benzo(b)thiophene	ND	ng/L	0.87	
Quinoline	ND	ng/L	6.6	
1H-Indole	ND	ng/L	2.4	
2-Methylnaphthalene	ND	ng/L	3.8	
1-Methylnaphthalene	ND	ng/L	2.7	
Biphenyl	ND	ng/L	4.1	
Acenaphthylene	ND	ng/L	1.3	
Acenaphthene	ND	ng/L	1.3	
Dibenzofuran	ND	ng/L	0.96	
Fluorene	ND	ng/L	0.96	
Dibenzothiophene	ND	ng/L	1.1	_
Phenanthrene	2.4	ng/L	1.3	В
Anthracene	ND	ng/L	2.6	
Acridine	ND	ng/L	5.9	
Carbazole	ND	ng/L	1.8	
Fluoranthene	ND	ng/L	3.0	
Pyrene	1.6	ng/L	1.3	В
Benzo(a)anthracene	ND	ng/L	2.4 2.7	
Chrysene	ND	ng/L	2.7	
Benzo(b)fluoranthene	ND	ng/L	2.4	
Benzo(k)fluoranthene	ND	ng/L	2.2	
Benzo(e)pyrene	ND	ng/L	1.8	
Benzo(a)pyrene	ND	ng/L	2.2	
Perylene	ND	ng/L	2.4	
Indeno(1,2,3-cd)pyrene	ND	ng/L	2.0	
Dibenz(a,h)anthracene	ND	ng/L	1.5	
Benzo(g,h,i)perylene	ND	ng/L	2.7	
Surrogate	Recovery		Limits	
Naphthalene-d8	60	*	21-108	
Fluorene-d10	. 72	% %	41-162	
Chrysene-d12	74	X	10-118	

All results and limits are corrected for dilution. Dilution factor is 0.96.

 $\mbox{\bf B} = \mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf ND} = \mbox{\bf Not}$ Detected

Reported By: Tom Claeys



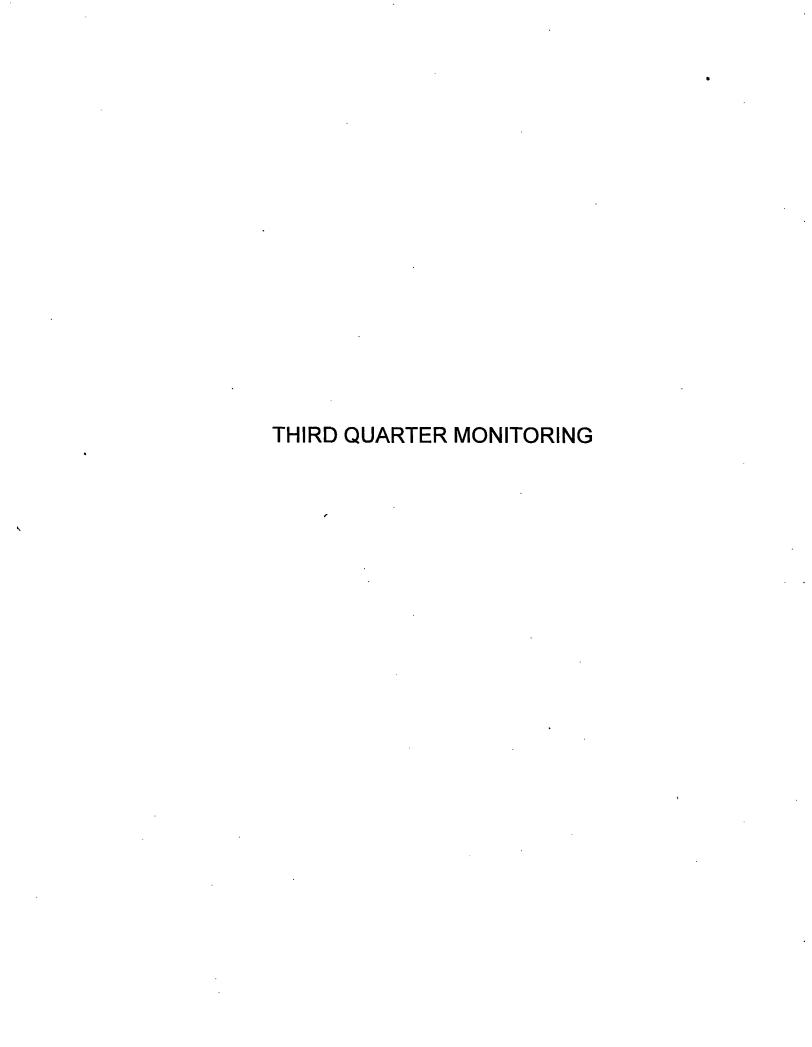
QC SUMMARY

The Quanterra laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

- 1. establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data,
- 2. assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix,
- 3. establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and
- 4. provide a standard set of reportables which assures the client of the quality of his data.

The Quanterra QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.





Advanced Analytical Services

Quanterra Incorporated 4955 Yarrow Street Arvada, Colorado 80002

303 421-6611 Telephone 303 467-9136 Fax

CASE NARRATIVE

FOR

City of St. Louis Park

October 22, 1998

Quanterra Environmental Services

Project Lot Number D8I290135

Introduction

Eight aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on September 29, 1998. The samples were logged in under Quanterra Denver's project lot number D8I290135. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for part per trillion (ppt) PAHs.

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1997 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

The spike compounds chrysene, indene, benzo (e) pyrene and quinoline were not recovered in either the matrix spike or matrix spike duplicate samples. The spike compounds naphthalene, 2 — methylnaphthalene and fluorene were recovered below the acceptance limits. All surrogate compounds were within acceptance limits. The laboratory control sample and method blank were within acceptance limits. A matrix effect is indicated.

Advanced Analytical Services



Except for the above, this data package is in compliance with the terms and conditions of the October 1997 QAPP, both technically and for completeness

Reported By:

/ Kurt C. Ill

Customer Service Manger

D8I290135

		REPORTIN	G	ANALYTICAL
PARAMETER	RESULT	LIMIT	UNITS	METHOD
GAC-SLP4T-092898 09/28/98 001				
Naphthalene	1.5 J	6.6	ng/L	SW846 8270A SIM
2-Methylnaphthalene	1.5 J	3.9	ng/L	SW846 8270A SIM
Acenaphthene	9.0	1.3	ng/L	SW846 8270A SIM
Phenanthrene	3.2	1.3	ng/L	SW846 8270A SIM
Anthracene	0.50 J	2.7	ng/L	SW846 8270A SIM
Carbazole	1.4 J	1.9	ng/L	SW846 8270A SIM
Fluoranthene	1.4 J	3.1	ng/L	SW846 8270A SIM
Pyrene	1.1 J	1.4	ng/L	SW846 8270A SIM
Indene	0.68 J	0.91	ng/L	SW846 8270A SIM
1-Methylnaphthalene	0.82 J	2.8	ng/L	SW846 8270A SIM
2,3-Dihydroindene	9.0	5.1	ng/L	SW846 8270A SIM
Biphenyl	0.28 J	4.4	ng/L	SW846 8270A SIM
Dipilon, i	0.20 0		5/	5 52 51
GAC-SLP4TD-092898 09/28/98 002				
Naphthalene	1.3 Ј	6.6	ng/L	SW846 8270A SIM
2-Methylnaphthalene	1.7 J	3.9	ng/L	SW846 8270A SIM
Acenaphthene	11	1.3	ng/L	SW846 8270A SIM
Fluorene	0.47 J	1.0	ng/L	SW846 8270A SIM
Phenanthrene	3.3	1.3	ng/L	SW846 8270A SIM
Anthracene	0.44 J	2.7	ng/L	SW846 8270A SIM
Carbazole	1.5 J	1.9	ng/L	SW846 8270A SIM
Fluoranthene	1.6 J	3.1	ng/L	SW846 8270A SIM
Pyrene	1.3 J	1.4	ng/L	SW846 8270A SIM
Indene	0.67 J	0.91	ng/L	SW846 8270A SIM
1-Methylnaphthalene	0.92 J	2.8	ng/L	SW846 8270A SIM
2,3-Dihydroindene	11	5.1	ng/L	SW846 8270A SIM
		3.1	9, 2	5110110 0211011 0211
GAC-SLP4TFB-092898 09/28/98 003			•	
Naphthalene	1.4 J	6.6	ng/L	SW846 8270A SIM
2-Methylnaphthalene	1.2 J	4.0	ng/L	SW846 8270A SIM
Fluorene	0.35 ர	1.0	ng/L	SW846 8270A SIM
Phenanthrene	2.8	1.3	ng/L	SW846 8270A SIM
Anthracene	3.1	2.7	ng/L	SW846 8270A SIM
Fluoranthene	1.1 J	3.2	ng/L	SW846 8270A SIM
Pyrene	0.70 J	1.4	ng/L	SW846 8270A SIM
Indene	0.24 J	0.92	ng/L	SW846 8270A SIM
1-Methylnaphthalene	0.77 J	2.9	ng/L	SW846 8270A SIM
2,3-Dihydroindene	0.35 J	5.1	ng/L	SW846 8270A SIM
Biphenyl	0.27 J	4.4	ng/L	SW846 8270A SIM
F1 -	· -		5,	- · · · - · · - · · - · · · · · · · · ·

(Continued on next page)

D8I290135

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GAC-SLP4TFBD-092898 09/28/98 004			,	
Naphthalene	1.0 J	6.6	ng/L	SW846 8270A SIM
2-Methylnaphthalene	1.2 J	3.9	ng/L	SW846 8270A SIM
Dibenzofuran	0.52 J	1.0	ng/L	SW846 8270A SIM
Phenanthrene	2.8	1.3	ng/L	SW846 8270A SIM
Anthracene	3.1	2.7	ng/L	SW846 8270A SIM
Fluoranthene	0.94 J	3.1	ng/L	SW846 8270A SIM
Pyrene	0.67 J	1.4	ng/L	SW846 8270A SIM
Indene	0.23 J	0.91	ng/L	SW846 8270A SIM
2,3-Dihydroindene	0.98 J	5.0	ng/L	SW846 8270A SIM
GAC-SLP4TLE-092898 09/28/98 005				
Acenaphthylene	2.0	1.4	ng/L	SW846 8270A SIM
Naphthalene	2.4 J	6.5	ng/L	SW846 8270A SIM
Acenaphthene	130	1.3	ng/L	SW846 8270A SIM
Fluorene	0.73 J	1.0	ng/L	SW846 8270A SIM
Phenanthrene	4.6	1.3	ng/L	SW846 8270A SIM
Anthracene	1.3 J	2.7	ng/L	SW846 8270A SIM
Carbazole	20	1.9	ng/L	SW846 8270A SIM
Fluoranthene	11	3.1	ng/L	SW846 8270A SIM
Pyrene	10	1.4	ng/L	SW846 8270A SIM
Indene	6.5	0.90	ng/L	SW846 8270A SIM
2,3-Benzofuran	1.0 J	5.1	ng/L	SW846 8270A SIM
2,3-Dihydroindene	120	5.0	ng/L	SW846 8270A SIM
Benzo (b) thiophene	22	0.90	ng/L	SW846 8270A SIM
Indole	4.7	2.5	ng/L	SW846 8270A SIM
Biphenyl	0.63 J	4.3	ng/L	SW846 8270A SIM
Dibenzothiophene	1.0 Ј	. 1.1	ng/L	SW846 8270A SIM
GAC-SLP10T-092898 09/28/98 006			•	
Naphthalene	1.6 Ј	6.6	ng/L	SW846 8270A SIM
2-Methylnaphthalene	1.3 J	4.0	ng/L	SW846 8270A SIM
Acenaphthene	2.6	1.3	ng/L	SW846 8270A SIM
Dibenzofuran	0.75 J	1.0	ng/L	SW846 8270A SIM
Fluorene	1.9	1.0	ng/L	SW846 8270A SIM
Phenanthrene	3.0	1.3	ng/L	SW846 8270A SIM
Anthracene	0.23 J	2.7	ng/L	SW846 8270A SIM
Fluoranthene	1.5 J	3.1	ng/L	SW846 8270A SIM
Pyrene	1.0 J	1.4	ng/L	SW846 8270A SIM
Indene	0.28 J	0.91	ng/L	SW846 8270A SIM
1-Methylnaphthalene	0.74 J	2.8	ng/L	SW846 8270A SIN
2,3-Dihydroindene	1.2 Ј	5.1	ng/L	SW846 8270A SIM

(Continued on next page)

D8I290135

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GAC-SLP10T-092898 09/28/98 006				
Biphenyl	0.49 J	4.4	ng/L	SW846 8270A SIM

ANALYTICAL METHODS SUMMARY

D8I290135

PARAMETER ANALYTICAL METHOD

Base/Neutrals and Acids SW846 8270A SIM

References:

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

METHOD / ANALYST SUMMARY

D8I290135

ANALYTICAL METHOD		ANALYST	ANALYST ID
SW846	8270A SIM	Dianne Buckheister	001210
Refere	nces:		
SW846		for Evaluating Solid Waste, Phy rd Edition, November 1986 and it	

QC DATA ASSOCIATION SUMMARY

D8I290135

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	SW846 8270A SIM		8273210	8273068
002	WATER	SW846 8270A SIM		8273210	8273068
003	WATER	SW846 8270A SIM		8273210	8273068
004	WATER	SW846 8270A SIM		8273210	8273068
005	WATER	SW846 8270A SIM		8273210	8273068
006	WATER	SW846 8270A SIM	•	8273210	8273068

SAMPLE SUMMARY

D8I290135

WO # !	SAMPLE	CLIENT SAMPLE ID	DATE TIME
CLX1W	001	GAC-SLP4T-092898	09/28/98
CLX21	002	GAC-SLP4TD-092898	09/28/98
CLX22	003	GAC-SLP4TFB-092898	09/28/98
CLX23	004	GAC-SLP4TFBD-092898	09/28/98
CLX25	005	GAC-SLP4TLE-092898	09/28/98
CLX26	006	GAC-SLP10T-092898	09/28/98
		,	
NOTE (S)		•	

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Client Sample ID: GAC-SLP4T-092898

GC/MS Semivolatiles

Lot-Sample #: D8I290135-001	Work Order #:	CLX1W101	Matrix: WATE	ъ.
Date Sampled: 09/28/98	Date Received:		THE PROPERTY OF THE PARTY OF TH	••
Prep Date: 09/30/98	Analysis Date:			
Prep Batch #: 8273210	Analysis Time:			
Dilution Factor: 1.01		20.01		
	Method:	SW846 8270)A SIM	
		2		
		REPORTING		
PARAMETER	RESULT	LIMIT	UNITS	
Acenaphthylene	ND	1.4	ng/L	
Naphthalene	1.5 J	6.6	ng/L	
2-Methylnaphthalene	1.5 J	3.9	ng/L	
Acenaphthene	9.0	1.3	ng/L	
Dibenzofuran	ND	1.0	ng/L	
Fluorene	ND	1.0	ng/L	
Phenanthrene	3.2	1.3	ng/L	
Anthracene	0.50 J	2.7	ng/L	
Carbazole	1.4 J	1.9	ng/L	:
Fluoranthene	1.4 J	3.1	ng/L	. :
Pyrene	1.1 J	1.4	ng/L	
Benzo(a)anthracene	ND	2.5	ng/L	
Chrysene	ND	2.8	ng/L	
Benzo(b)fluoranthene	ND	2.5	ng/L	
Benzo(k)fluoranthene	ND	2.3	ng/L	;
Benzo(a)pyrene	ND	2.3	ng/L	. •
Indeno(1,2,3-cd)pyrene	ND	2.1	ng/L	
Benzo(ghi)perylene	ND	2.8	ng/L	
Indene	0.68 J	0.91	ng/L	
1-Methylnaphthalene	0.82 J	2.8	ng/L	
2,3-Benzofuran	ND .	5.2	ng/L	
2,3-Dihydroindene	9.0	5.1	ng/L	
Benzo(b) thiophene	ND	0.91	ng/L	
Indole	ND	2.5	ng/L	
Biphenyl	0.28 J	4.4	ng/L	
Dibenzothiophene	ND	1.1	ng/L	
Acridine	ND	6.2	ng/L	
Benzo(e)pyrene	ND	1.9	ng/L	
Perylene	ND	2.5	ng/L	
Quinoline	ND	7.0	ng/L	
Dibenz (a, h) anthracene	ND	1.6	ng/L	
, .,			<u>.</u> .	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS		
Chrysene-d12	34	(10 - 118)		
Fluorene d-10	58	(41 - 162)		
Naphthalene-d8	54	(21 - 108)		-

J Estimated result. Result is less than RL.

Client Sample ID: GAC-SLP4TD, 092898

GC/MS Semivolatiles

Lot-Sample #: D8I290135-002 Date Sampled: 09/28/98 Prep Date: 09/30/98 Prep Batch #: 8273210 Dilution Factor: 1.01	Work:Order #: Date Received: Analysis Date: Analysis Time:	09/29/98 10/15/98	Matrix:	WATER
	Method:	SW846 8270	A SIM	
PARAMETER	RESULT	REPORTING LIMIT	UNITS	
Acenaphthylene	ND	1.4	ng/L	
Naphthalene	1.3 J	6.6	ng/L	
2-Methylnaphthalene	1.7 J	3.9	ng/L	
Acenaphthene	11	1.3	ng/L	
Dibenzofuran	ND	1.0	ng/L	
Fluorene	0.47 J	1.0	ng/L	
Phenanthrene	3.3	1.3	ng/L	
Anthracene	0.44 J	2.7	ng/L	
Carbazole	1.5 J	1.9	ng/L	
Fluoranthene	1.6 J	3.1	ng/L	
Pyrene	1.3 J	1.4	ng/L	
Benzo (a) anthracene	ND	2.5	ng/L	
Chrysene	ND	2.8	ng/L	
Benzo(b) fluoranthene	ND	2.5	ng/L	
Benzo(k) fluoranthene	ND	2.3	ng/L	٠,
Benzo (a) pyrene	ND	2.3	ng/L	
Indeno(1,2,3-cd)pyrene	ND	2.1	ng/L	
Benzo(ghi)perylene	ND	2.8	ng/L	
Indene	0.67 J	0.91	ng/L	
1-Methylnaphthalene	0.92 J	2.8	ng/L	
2,3-Benzofuran	ND	5.2	ng/L	
2,3-Dihydroindene	11	5.1	ng/L	
Benzo(b)thiophene	ND	0.91	ng/L	
Indole	ND	2.5	ng/L	
Biphenyl	ND	4.4	ng/L	
Dibenzothiophene	ND	1.1	ng/L	
Acridine	ND	6.2	ng/L	
Benzo(e)pyrene	ND	1.9	ng/L	
Perylene	ND	2.5	ng/L	
Quinoline	ND	7.0	ng/L	
Dibenz(a,h)anthracene	ND	1.6	ng/L	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS	_	
Chrysene-d12	38	(10 - 118)		
Fluorene d-10	66	(41 - 162)		
Naphthalene-d8	61	(21 - 108)		

J Estimated result. Result is less than RL.

Client Sample ID: GAC-SLP4TFB-092898

GC/MS Semivolatiles

Lot-Sample #: D8I290135-003 Date Sampled: 09/28/98 Prep Date: 09/30/98 Prep Batch #: 8273210 Dilution Factor: 1.01	Work Order #: Date Received: Analysis Date: Analysis Time:	09/29/98 10/15/98	Matrix:	WATER
	Method:	SW846 8270	DA SIM	
		REPORTING		
PARAMETER	RESULT	LIMIT	UNITS	
Acenaphthylene	ND	1.4	ng/L	
Naphthalene	1.4 J	6.6	ng/L	
2-Methylnaphthalene	1.2 J	4.0	ng/L	
Acenaphthene	ND	1.3	ng/L	
Dibenzofuran	ND	1.0	ng/L	
Fluorene	0.35 J	1.0	ng/L	
Phenanthrene	2.8	1.3	ng/L	
Anthracene	3.1	2.7	ng/L	
Carbazole	ND	1.9	ng/L	
Fluoranthene	1.1 J	3.2	ng/L	٠.
Pyrene	0.70 Ј	1.4	ng/L	
Benzo(a)anthracene	ND	2.5	ng/L	
Chrysene	ND	2.9	ng/L	
Benzo(b)fluoranthene	ND	2.5	ng/L	. •
Benzo(k)fluoranthene	ND	2.3	ng/L	•
Benzo (a) pyrene	ND	2.3	ng/L	
Indeno(1,2,3-cd)pyrene	ND	2.1	ng/L	
Benzo(ghi)perylene	ND	2.9	ng/L	
Indene	0.24 J	0.92	ng/L	
1-Methylnaphthalene	0.77 J	2.9	ng/L	
2,3-Benzofuran	ND	5.2	ng/L	•
2,3-Dihydroindene	0.35 J	5.1	ng/L	
Benzo(b)thiophene	ND	0.92	ng/L	
Indole	ND	2.5	ng/L	
Biphenyl	0.27 J	4.4	ng/L	
Dibenzothiophene	ND	1.1	ng/L	
Acridine	ND	6.2	ng/L	
Benzo(e)pyrene	ND	1.9	ng/L	-
Perylene	ND	2.5	ng/L	
Quinoline	ND	7.0	ng/L	9
Dibenz(a,h)anthracene	ND	1.6	ng/L	
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS		
Chrysene-d12	59	(10 - 118)		
Fluorene d-10	59	(41 - 162)		•
Naphthalene-d8	65	(21 - 108)		
NOTE(S):				-,
				

J Estimated result. Result is less than RL.

Client Sample ID: GAC-SLP4TFBD-092898

GC/MS Semivolatiles

Lot-Sample #...: D8I290135-004 Work Order #...: CLX23101 Matrix.....: WATER

Date Sampled...: 09/28/98 Date Received..: 09/29/98

Prep Date....: 09/30/98 Analysis Date..: 10/15/98

Prep Batch #...: 8273210 Analysis Time..: 23:35

Dilution Factor: 1.01

Method....: SW846 8270A SIM

		REPORTIN	'G
PARAMETER	RESULT	LIMIT	UNITS
Acenaphthylene	ND	1.4	ng/L
Naphthalene	1.0 J	6.6	ng/L
2-Methylnaphthalene	1.2 J	3.9	ng/L
Acenaphthene	ND	1.3	ng/L
Dibenzofuran	0.52 J	1.0	ng/L
Fluorene	ND	1.0	ng/L
Phenanthrene	2.8	1.3	ng/L
Anthracene	3.1	2.7	ng/L
Carbazole	ND	1.9	ng/L
Fluoranthene	0.94 J	3.1	ng/L
Pyrene	0.67 J	1.4	ng/L
Benzo(a) anthracene	ND	2.5	ng/L
Chrysene	ND	2.8	ng/L
Benzo(b) fluoranthene	ND	2.5	ng/L
Benzo(k) fluoranthene	ND .	2.3	ng/L
Benzo(a)pyrene	ND	2.3	ng/L
Indeno(1,2,3-cd)pyrene	ND	2.1	ng/L
Benzo(ghi)perylene	ND	2.8	ng/L
Indene	0.23 J	0.91	ng/L
1-Methylnaphthalene	ND	2.8	ng/L
2,3-Benzofuran	ND	5.2	ng/L
2,3-Dihydroindene	0.98 J	5.0	ng/L
Benzo(b) thiophene	ND	0.91	ng/L
Indole	ND	2.5	ng/L
Biphenyl	ND	4.3	ng/L
Dibenzothiophene	ND	1.1	ng/L
Acridine	ND	6.2	ng/L
Benzo(e)pyrene	ND	1.9	ng/L
Perylene	ND	2.5	ng/L
Quinoline	ND	7.0	ng/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	<u></u>
Chrysene-d12	55	(10 - 11)	
Fluorene d-10	61	(41 - 16	2)
Naphthalene-d8	50	(21 - 10	8)

J Estimated result. Result is less than RL.

Client Sample ID: GAC-SLP4TLE-092898

GC/MS Semivolatiles

Date Sampled : D81290115-005 Date Received : 09/28/98 Pate Pate : 09/30/98 Pate Received : 09/28/98 Pate Received : 00:11 Pate Received : 00:11	Lot-Sample #: D8I290135-005	Work Order # .	CI V25101	Matrice W	3.000
Prep Datch # 8273210 Analysis Date 10/16/98 Analysis Time 00:11		**		Matrix W	ATER
Prep Batch #: 8273210 Method					
Method		-			
Method	-	Analysis Time:	00:11		
PARAMETER	Dilution Factor: 1	Wathad .	CW046 0070	A CTM	•
PARAMETER		method:	SW846 8270	A SIM	
PARAMETER			PEDOPTING		
Acenaphthylene 2.0 1.4 ng/L	PARAMETER	RESULT		UNITS	
Naphthalene			1.4		
2-Methylnaphthalene			6.5	- ·	
Acenaphthene 130	2-Methylnaphthalene	ND	3.9	_	
Fluorene 0.73 J 1.0 ng/L		130	1.3	_	-
Phenanthrene	Dibenzofuran	ND	1.0	ng/L	
Anthracene 1.3 J 2.7 ng/L Carbazole 20 1.9 ng/L Fluoranthene 11 3.1 ng/L Fluoranthene 11 3.1 ng/L Fyrene 10 1.4 ng/L Benzo(a) anthracene NL 2.5 ng/L Benzo(b) fluoranthene ND 2.8 ng/L Benzo(b) fluoranthene ND 2.5 ng/L Benzo(b) fluoranthene ND 2.3 ng/L Benzo(a) pyrene ND 2.3 ng/L Indeno(1,2,3-cd) pyrene ND 2.1 ng/L Benzo(ghi) perylene ND 2.8 ng/L Indene 6.5 0.90 ng/L Indene 6.5 0.90 ng/L 1-Methylnaphthalene ND 2.8 ng/L 2,3-Benzofuran 1.0 J 5.1 ng/L 2,3-Dihydroindene 120 5.0 ng/L Benzo(b) thiophene 120 5.0 ng/L Benzo(b) thiophene 120 5.0 ng/L Benzo(b) thiophene 1.0 J 1.1 ng/L Benzo(b) thiophene 1.0 J 1.1 ng/L Benzo(e) pyrene ND 1.9 ng/L Dibenzothiophene ND 1.9 ng/L Perylene ND 1.9 ng/L Percent RECOVERY LIMITS Chrysene-d12 RECOVERY LIMITS Fluorene d-10 70 (41 - 162)	Fluorene	0.73 J	1.0	ng/L	1 1
Carbazole 20	Phenanthrene	4.6	1.3	ng/L	
Fluoranthene	Anthracene	1.3 J	2.7	ng/L	
Pyrene 10	Carbazole	20	1.9	ng/L	
Benzo(a) anthracene	Fluoranthene	11	3.1	ng/L	1.1
Chrysene	Pyrene	10	1.4	ng/L	
Benzo (b) fluoranthene ND 2.5 ng/L	Benzo(a) anthracene	ND	2.5	ng/L	
Benzo (k) fluoranthene	Chrysene	ND	2.8	ng/L	
Benzo(a) pyrene	Benzo(b) fluoranthene	.ND	2.5	ng/L	
Indeno(1,2,3-cd) pyrene ND 2.1 ng/L	Benzo(k) fluoranthene	ND	2.3	ng/L	4
Benzo (ghi) perylene	Benzo(a)pyrene	ND	2.3	ng/L	•
Indene	Indeno(1,2,3-cd)pyrene	ND	2.1	ng/L	
1-Methylnaphthalene ND 2.8 ng/L 2,3-Benzofuran 1.0 J 5.1 ng/L 2,3-Dihydroindene 120 5.0 ng/L Benzo(b) thiophene 22 0.90 ng/L Indole 4.7 2.5 ng/L Biphenyl 0.63 J 4.3 ng/L Dibenzothiophene 1.0 J 1.1 ng/L Acridine ND 6.1 ng/L Benzo(e) pyrene ND 1.9 ng/L Perylene ND 2.5 ng/L Quinoline ND 6.9 ng/L Dibenz (a,h) anthracene ND 1.6 ng/L PERCENT RECOVERY SURROGATE RECOVERY Fluorene d-10 70 (41 - 162)	Benzo(ghi)perylene	ND	2.8	ng/L	•
2,3-Benzofuran 1.0 J 5.1 ng/L 2,3-Dihydroindene 120 5.0 ng/L Benzo(b) thiophene 22 0.90 ng/L Indole 4.7 2.5 ng/L Biphenyl 0.63 J 4.3 ng/L Dibenzothiophene 1.0 J 1.1 ng/L Acridine ND 6.1 ng/L Benzo(e) pyrene ND 1.9 ng/L Perylene ND 2.5 ng/L Quinoline ND 6.9 ng/L Dibenz (a,h) anthracene PERCENT RECOVERY SURROGATE Chrysene-d12 Fluorene d-10 70 1.0 J 1.1 ng/L R. RECOVERY LIMITS (10 - 118) Fluorene d-10 1.0 J 1.1 ng/L R. RECOVERY LIMITS RECOVERY LIMITS RECOVERY LIMITS RECOVERY LIMITS	Indene	6.5	0.90	ng/L	
2,3-Dihydroindene	1-Methylnaphthalene	ND	2.8	ng/L	
Benzo (b) thiophene 22 0.90 ng/L Indole 4.7 2.5 ng/L Biphenyl 0.63 J 4.3 ng/L Dibenzothiophene 1.0 J 1.1 ng/L Acridine ND 6.1 ng/L Benzo (e) pyrene ND 1.9 ng/L Perylene ND 2.5 ng/L Quinoline ND 6.9 ng/L Dibenz (a, h) anthracene ND 1.6 ng/L PERCENT RECOVERY SURROGATE RECOVERY LIMITS Chrysene-d12 32 (10 - 118) Fluorene d-10 70 (41 - 162)	2,3-Benzofuran	1.0 J	5.1	ng/L	,
Indole	2,3-Dihydroindene	120	5.0	ng/L	
Biphenyl 0.63 J 4.3 ng/L Dibenzothiophene 1.0 J 1.1 ng/L Acridine ND 6.1 ng/L Benzo(e)pyrene ND 1.9 ng/L Perylene ND 2.5 ng/L Quinoline ND 6.9 ng/L Dibenz(a,h)anthracene ND 1.6 ng/L PERCENT RECOVERY SURROGATE RECOVERY LIMITS Chrysene-dl2 32 (10 - 118) Fluorene d-10 70 (41 - 162)	Benzo(b) thiophene	22	0.90	ng/L	
Dibenzothiophene 1.0 J 1.1 ng/L Acridine ND 6.1 ng/L Benzo(e)pyrene ND 1.9 ng/L Perylene ND 2.5 ng/L Quinoline ND 6.9 ng/L Dibenz(a,h)anthracene ND 1.6 ng/L PERCENT RECOVERY SURROGATE RECOVERY LIMITS Chrysene-d12 32 (10 - 118) Fluorene d-10 70 (41 - 162)	Indole	4.7	2.5	ng/L	
Acridine ND 6.1 ng/L Benzo(e)pyrene ND 1.9 ng/L Perylene ND 2.5 ng/L Quinoline ND 6.9 ng/L Dibenz(a,h)anthracene ND 1.6 ng/L PERCENT RECOVERY SURROGATE RECOVERY LIMITS Chrysene-d12 32 (10 - 118) Fluorene d-10 70 (41 - 162)	Biphenyl	0.63 J	4.3	ng/L	
Benzo (e) pyrene ND 1.9 ng/L Perylene ND 2.5 ng/L Quinoline ND 6.9 ng/L Dibenz (a, h) anthracene ND 1.6 ng/L PERCENT RECOVERY SURROGATE RECOVERY LIMITS Chrysene-d12 32 (10 - 118) Fluorene d-10 70 (41 - 162)	Dibenzothiophene	1.0 J	1.1	ng/L	
Perylene ND 2.5 ng/L Quinoline ND 6.9 ng/L Dibenz(a,h) anthracene ND 1.6 ng/L PERCENT RECOVERY SURROGATE RECOVERY LIMITS Chrysene-d12 32 (10 - 118) Fluorene d-10 70 (41 - 162)	Acridine	ND	6.1	ng/L	
Quinoline ND 6.9 ng/L Dibenz(a,h)anthracene ND 1.6 ng/L PERCENT RECOVERY SURROGATE RECOVERY LIMITS Chrysene-dl2 32 (10 - 118) Fluorene d-10 70 (41 - 162)	Benzo(e)pyrene	ND	1.9		
Dibenz (a, h) anthracene ND 1.6 ng/L PERCENT RECOVERY SURROGATE RECOVERY LIMITS Chrysene-dl2 32 (10 - 118) Fluorene d-10 70 (41 - 162)	Perylene	ND		ng/L	-
SURROGATE RECOVERY Chrysene-d12 32 (10 - 118) Fluorene d-10 70 (41 - 162)	Quinoline	ND	6.9	ng/L	
SURROGATE RECOVERY LIMITS Chrysene-d12 32 (10 - 118) Fluorene d-10 70 (41 - 162)	Dibenz(a,h) anthracene	ND	1.6	ng/L	
SURROGATE RECOVERY LIMITS Chrysene-d12 32 (10 - 118) Fluorene d-10 70 (41 - 162)					
Chrysene-d12 32 (10 - 118) Fluorene d-10 70 (41 - 162)					
Fluorene d-10 70 (41 - 162)					
Naphthalene-d8 74 (21 - 108)					•
	Naphthalene-d8	74	(21 - 108)		

J Estimated result. Result is less than RL.

Client Sample ID: GAC-SLP10T-092898

GC/MS Semivolatiles

Lot-Sample #: D8I290135-006 Date Sampled: 09/28/98 Prep Date: 09/30/98 Prep Batch #: 8273210 Dilution Factor: 1.01	Work: Order #: Date Received: Analysis Date: Analysis Time:	09/29/98 10/16/98	Matrix: WATER
	Method:	SW846 8270	A SIM
PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthylene	ND	1.4	ng/L
Naphthalene	1.6 J	6.6	ng/L
2-Methylnaphthalene	1.3 J	4.0	ng/L
Acenaphthene	2.6	1.3	ng/L
Dibenzofuran	0.75 J	1.0	ng/L
Fluorene	1.9	1.0	ng/L
Phenanthrene	3.0	1.3	ng/L
Anthracene	0.23 J	2.7	ng/L
Carbazole	ND	1.9	ng/L
Fluoranthene	1.5 J	3.1	ng/L
Pyrene	1.0 J	1.4	ng/L
Benzo(a) anthracene	ND	2.5	ng/L
Chrysene	ND	2.8	ng/L
Benzo(b) fluoranthene	ND	2.5	ng/L
Benzo(k) fluoranthene	ND	2.3	ng/L
Benzo(a)pyrene	ND	2.3	ng/L
Indeno (1, 2, 3-cd) pyrene	ND	2.1	ng/L
Benzo(ghi)perylene	ND	2.8	ng/L
Indene	0.28 J	0.91	ng/L
1-Methylnaphthalene	0.74 J	2.8	ng/L
2,3-Benzofuran	ND	5.2	ng/L
2,3-Dihydroindene	1.2 J	5.1	ng/L
Benzo(b) thiophene	ND	0.91	ng/L
Indole	ND	2.5	ng/L
Biphenyl	0.49 J	4.4	ng/L
Dibenzothiophene	ND	1.1	ng/L
Acridine	ND .	6.2	ng/L
Benzo(e)pyrene	ND	1.9	ng/L
Perylene	ND	2.5	ng/L
Quinoline	ND	7.0	ng/L
Dibenz(a,h)anthracene	ND	1.6	ng/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	
Chrysene-d12	32	(10 - 118)	-
Fluorene d-10	61	(41 - 162)	
Naphthalene-d8	57	(21 - 108)	·
p		,	

J Estimated result. Result is less than RL.

METHOD BLANK REPORT

GC/MS Semivolatiles

Client Lot #...: D8I290135

MB Lot-Sample #: D8I300000-210

Work Order #...: CM099101

Matrix....: WATER

Prep Date....: 09/30/98 Prep Batch #...: 8273210

Analysis Time..: 17:33

Analysis Date..: 10/15/98

Dilution Factor: 1

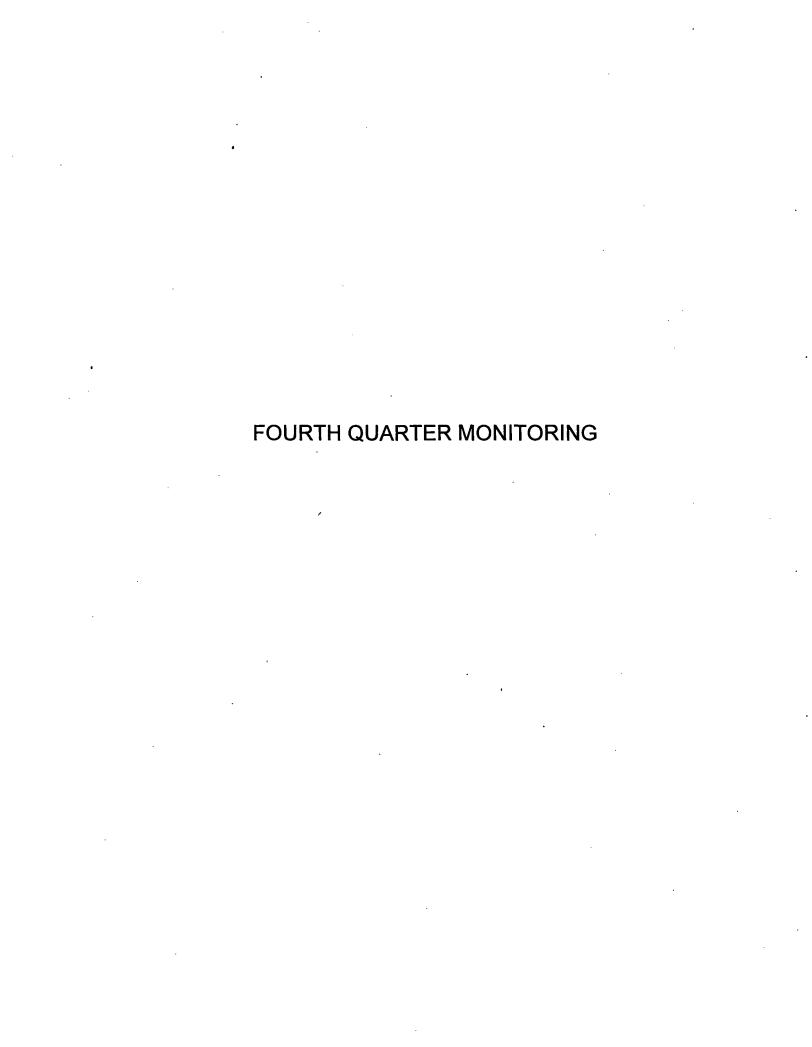
REPORTING

		REPORTING		
PARAMETER	RESULT	LIMIT	UNITS	METHOD
Acenaphthylene	ND .	1.4	ng/L	SW846 8270A SIM
Naphthalene	ND	6.5	ng/L	SW846 8270A SIM
2-Methylnaphthalene	1.2 J	3.9	ng/L	SW846 8270A SIM
Acenaphthene	0.21 J	1.3	ng/L	SW846 8270A SIM
Dibenzofuran	0.54 J	1.0	ng/L	SW846 8270A SIM
Fluorene	0.55 J	1.0	ng/L	SW846 8270A SIM
Phenanthrene	3.3	1.3	ng/L	SW846 8270A SIM
Anthracene	ND	2.7	ng/L	SW846 8270A SIM
Carbazole	ND	1.9	ng/L	SW846 8270A SIM
Fluoranthene	1.2 J	3.1	ng/L	SW846 8270A SIM
Pyrene	0.82 J	1.4	ng/L	SW846 8270A SIM
Benzo(a) anthracene	ND	2.5	ng/L	SW846 8270A SIM
Chrysene	0.28 J	2.8	ng/L	SW846 8270A SIM
Benzo(b)fluoranthene	ND	2.5	ng/L	SW846 8270A SIM
Benzo(k)fluoranthene	ND	2.3	ng/L	SW846 8270A SIM
Benzo(a)pyrene	ND	2.3	ng/L	SW846 8270A SIM
Indeno(1,2,3-cd)pyrene	ND	2.1	ng/L	SW846 8270A SIM
Benzo(ghi)perylene	ND	2.8	ng/L	SW846 8270A SIM
Indene	0.26 Ј	0.90	ng/L	SW846 8270A SIM
1-Methylnaphthalene	0.88 J	2.8	ng/L	SW846 8270A SIM
2,3-Benzofuran	ND	5.1	ng/L	SW846 8270A SIM
2,3-Dihydroindene	0.16 J	5.0	ng/L	SW846 8270A SIM
Benzo(b) thiophene	ND	0.90	ng/L	SW846 8270A SIM
Indole	ND	2.5	ng/L	SW846 8270A SIM
Biphenyl	0.30 J	4.3	ng/L	SW846 8270A SIM
Dibenzothiophene	ND	1.1	ng/L	SW846 8270A SIM
Acridine	ND	6.1	ng/L	SW846 8270A SIM
Benzo(e)pyrene	ND	1.9	ng/L	SW846 8270A SIM
Perylene	ND	2.5	ng/L	SW846 8270A SIM
Quinoline	ND	6.9	ng/L	SW846 8270A SIM
Dibenz(a,h)anthracene	ND	1.6	ng/L	SW846 8270A SIM
•	PERCENT	RECOVERY	?	
SURROGATE	RECOVERY	LIMITS		
Chrysene-d12	66	(10 - 11		
Fluorene d-10	71	(41 - 16		
Naphthalene-d8	74	(21 - 10	8)	

Calculations are performed before rounding to avoid round-off errors in calculated results.

Results and reporting limits have been adjusted for dry weight.

J Estimated result. Result is less than RL.





Quanterra Incorporated 4955 Yarrow Street Arvada, Colorado 80002

303 421-6611 Telephone 303 431-7171 Fax

ANALYTICAL REPORT

Reilly Tar & Chemical NPL Site

Lot #: D8K040108

Scott Anderson

City of St. Louis Park

QUANTERRA INCORPORATED

Kurt C. Ill
Project Manager

January 7, 1999



Advanced Analytical Services

Quanterra Incorporated 4955 Yarrow Street Arvada, Colorado 80002

303 421-6611 Telephone 303 467-9136 Fax

CASE NARRATIVE

FOR

City of St. Louis Park

January 7, 1999

Quanterra Environmental Services

Project Lot Number D8K040108

Introduction

Eight aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on November 4, 1998. The samples were logged in under Quanterra Denver's project lot number D8K040108. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for part per trillion (ppt) PAHs.

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1997 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

Client sample with laboratory Id D8K040108-005 was analyzed at a dilution due to target analytes exceeding the linear range of the instrument. The reporting limits were raised accordingly.

The spike compound benzo (e) pyrene in both the matrix spike and matrix spike duplicate samples is reported at 9.6% abd 13% recovery which are below the 20% to 150% acceptance limits. Benzo (e) pyrene was recovered within acceptance limits in the Laboratory Control Sample. A matrix effect is indicated.

The relative percent difference (RPD) for the spike compounds 2-methylnaphthalene, fluorene and benzo (e) pyrene are reported above the 0% to 20% acceptance criteria. All recoveries were within acceptance limits.

Advanced Analytical Services



The following compounds were reported above the MDL but below the reporting limit (RL) in the method blank: benz0 (a) anthracene, benzo (b) fluoranthrene, benzo (a) pyrene and perylene.

Except for the above, this data package is in compliance with the terms and conditions of the October 1997 QAPP, both technically and for completeness

Reported By:

Kurt C. Ill

Customer Service Manger

D8K040108

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GAC-SLP4T-110398 11/03/98 001				
Acenaphthylene	0.58 J	1.4	ng/L	SW846 8270A SIM
Naphthalene	2.8 J	6.5	ng/L	SW846 8270A SIM
2-Methylnaphthalene	2.6 J	3.9	ng/L	SW846 8270A SIM
Acenaphthene	20	1.3	ng/L	SW846 8270A SIM
Dibenzofuran	0.93 J	1.0	ng/L	SW846 8270A SIM
Fluorene	0.96 J	1.0	ng/L	SW846 8270A SIM
Phenanthrene	5.7	1.3	ng/L	SW846 8270A SIM
Anthracene	0.50 J	2.7	ng/L	SW846 8270A SIM
Carbazole	3.3	1.9	ng/L	SW846 8270A SIM
Fluoranthene	3.3	3.1	ng/L	SW846 8270A SIM
Pyrene	2.5	1.4	ng/L	SW846 8270A SIM
Benzo(a) anthracene	0.062 J	2.5	ng/L	SW846 8270A SIM
Chrysene	0.096 J	2.8	ng/L	SW846 8270A SIM
Benzo(b) fluoranthene	0.094 J	2.5	ng/L	SW846 8270A SIM
Benzo(k) fluoranthene	0.084 J	2.3	ng/L	SW846 8270A SIM
Benzo(a) pyrene	0.073 J	2.3	ng/L	SW846 8270A SIM
Benzo (ghi) perylene	0.12 J	2.8	ng/L	SW846 8270A SIM
Indene	1.2	0.90	ng/L	SW846 8270A SIM
1-Methylnaphthalene	1.5 J	2.8	ng/L	SW846 8270A SIM
2,3-Benzofuran	0.28 J	5.1	ng/L	SW846 8270A SIM
2,3-Dihydroindene	20	5.0	ng/L	SW846 8270A SIM
Benzo(b) thiophene	2.8	0.90	ng/L	SW846 8270A SIM
Indole	0.37 J	2.5	ng/L	SW846 8270A SIM
Biphenyl	20	4.3	ng/L	SW846 8270A SIM
Dibenzothiophene	0.58 J	1:1	ng/L	SW846 8270A SIM
Acridine	3.0 J	6.1	ng/L	SW846 8270A SIM
Benzo(e)pyrene	0.063 J	1.9	ng/L	SW846 8270A SIM
Quinoline	2.4 J	6.9	ng/L	SW846 8270A SIM
GAC-SLP4TD-110398 11/03/98 002	15			•
				·
Acenaphthylene	0.70 J	1.4	ng/L	SW846 8270A SIM
Naphthalene	2.7 J	6.5	ng/L	SW846 8270A SIM
2-Methylnaphthalene	2.1 J	3.9	ng/L	SW846 8270A SIM
Acenaphthene	20	1.3	ng/L	SW846 8270A SIM
Dibenzofuran	1.1	1.0	ng/L	SW846 8270A SIM
Fluorene	1.1	1.0	ng/L	SW846 8270A SIM
Phenanthrene	3.9	1.3	ng/L	SW846 8270A SIM
Anthracene	0.53 J	2.7	ng/L	SW846 8270A SIM
Carbazole	3.4	1.9	ng/L	SW846 8270A SIM
Fluoranthene	2.9 J	3.1	ng/L	SW846 8270A SIM
Pyrene	2.3	1.4	ng/L	SW846 8270A SIM
Benzo(a) anthracene	0.078 J	2.5	ng/L	SW846 8270A SIM

(Continued on next page)

D8K040108

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GAC-SLP4TD-110398 11/03/98 002				
			/	
Chrysene	0.12 J	2.8	ng/L	SW846 8270A SIM
Benzo (b) fluoranthene	0.15 J	2.5	ng/L	SW846 8270A SIM
Benzo(k) fluoranthene	0.10 J	2.3	ng/L	SW846 827.0A SIM
Benzo (a) pyrene	0.094 J	2.3	ng/L	SW846 8270A SIM
Indeno(1,2,3-cd)pyrene	0.070 J	2.1	ng/L	SW846 8270A SIM
Benzo(ghi)perylene	0.32 J	2.8	ng/L	SW846 8270A SIM
Indene	1.2	0.90	ng/L	SW846 8270A SIM
1-Methylnaphthalene	1.1 J	2.8	ng/L	SW846 8270A SIM
2,3-Benzofuran	0.26 J	5.1	ng/L	SW846 8270A SIM
2,3-Dihydroindene	20	5.0	ng/L	SW846 8270A SIM
Benzo(b)thiophene	2.8	0.90	ng/L	SW846 8270A SIM
Indole	0.44 J	2.5	ng/L	SW846 8270A SIM
Biphenyl	20	4.3	ng/L	SW846 8270A SIM
Dibenzothiophene	0.75 J	1.1	ng/L	SW846 8270A SIM
Acridine	3.1 J	6.1	ng/L	SW846 8270A SIM
Benzo(e)pyrene	0.15 J	1.9	ng/L	SW846 8270A SIM
Perylene	0.13 J	2.5	ng/L	SW846 8270A SIM
Quinoline	3.6 J	6.9	ng/L	SW846 8270A SIM
Dibenz(a,h)anthracene	0.054 J	1.6	ng/L	SW846 8270A SIM
GAC-SLP4TFB-110398 11/03/98 003	c ₁			
Acenaphthylene	0.23 J	1.4	ng/L	SW846 8270A SIM
Naphthalene	2.0 J	6.5	ng/L	SW846 8270A SIM
2-Methylnaphthalene	1.7 J	3.9	ng/L	SW846 8270A SIM
Acenaphthene	1.2 J	1.3	ng/L	SW846 8270A SIM
Dibenzofuran	0.29 J	1.0	ng/L	SW846 8270A SIM
Fluorene	0.61 J	1.0	ng/L	SW846 8270A SIM
Phenanthrene	4.1	1.3	ng/L	SW846,8270A SIM
Anthracene	0.34 J	2.7	ng/L	SW846 8270A SIM
Carbazole	0.12 J	1.9	ng/L	SW846 8270A SIM
Fluoranthene	1.6 J	3.1	ng/L	SW846 8270A SIM
Pyrene	1.1 J	1.4	ng/L	SW846 8270A SIM
Benzo(a) anthracene	0.055 J	2.5	ng/L	SW846 8270A SIM
Chrysene	0.10 J	2.8	ng/L	SW846 8270A SIM
Benzo(b)fluoranthene	0.085 J	2.5	ng/L	SW846 8270A SIM
Benzo(k) fluoranthene	0.077 J	2.3	ng/L	SW846 8270A SIM
Benzo(a)pyrene	0.068 J	2.3	ng/L	SW846 8270A SIM
Benzo(ghi)perylene	0.060 J	2.8	ng/L	SW846 8270A SIM
Indene	0.31 J	0.90	ng/L	SW846 8270A SIM
1-Methylnaphthalene	0.80 J	2.8	ng/L	SW846 8270A SIM
2,3-Benzofuran	0.33 J	5.1	ng/L	SW846 8270A SIM
2,3-Dihydroindene	0.60 J	5.0	ng/L	SW846 8270A SIM

(Continued on next page)

EXECUTIVE SUMMARY - Detection Highlights

D8K040108

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GAC-SLP4TFB-110398 11/03/98 003				
Benzo(b)thiophene	0.055 J	0.90	ng/L	SW846 8270A SIM
Indole	0.31 J	2.5	ng/L	SW846 8270A SIM
Biphenyl	1.2 J	4.3	ng/L	SW846 8270A SIM
Dibenzothiophene	0.27 J	1.1	ng/L	SW846 8270A SIM
Acridine	2.5 J	6.1	ng/L	SW846 8270A SIM
Benzo(e)pyrene	0.058 J	1.9	ng/L	SW846 8270A SIM
Perylene	0.048 Ј	2.5	ng/L	SW846 8270A SIM
Quinoline	1.1 J	6.9	ng/L	SW846 8270A SIM
GAC-SLP4TFBD-110398 11/03/98 004				
Acenaphthylene	0.20 J	1.4	ng/L	SW846 8270A SIM
Naphthalene	1.9 J	6.5	ng/L	SW846 8270A SIM
2-Methylnaphthalene	1.6 J	3.9	ng/L	SW846 8270A SIM
Acenaphthene	1.0 J	1.3	ng/L	SW846 8270A SIM
Dibenzofuran	0.29 J	1.0	ng/L	SW846 8270A SIM
Fluorene	0.56 J	1.0	ng/L	SW846 8270A SIM
Phenanthrene	3.5	1.3 ,	ng/L	SW846 8270A SIM
Anthracene	0.25 J	2.7	ng/L	SW846 8270A SIM
Carbazole	0.16 J	1.9	ng/L	SW846 8270A SIM
Fluoranthene	1.5 J	3.1	ng/L	SW846 8270A SIM
Pyrene	0.86 J	1.4	ng/L	SW846 8270A SIM
Benzo(a) anthracene	0.049 J	2.5	ng/L	SW846 8270A SIM
Chrysene	0.090 J	2.8	ng/L	SW846 8270A SIM
Benzo(b) fluoranthene	0.083 J	2.5	ng/L	SW846 8270A SIM
Benzo(k) fluoranthene	0.075 J	2.3	ng/L	SW846 8270A SIM
Benzo(a)pyrene	0.062 J	2.3	ng/L	SW846 8270A SIM
Indene	0.26 J	0.90	ng/L	SW846 8270A SIM
1-Methylnaphthalene	0.71 J	2.8	ng/L	SW846 8270A SIM
2,3-Benzofuran	0.29 J	5.1	ng/L	SW846 8270A SIM
2,3-Dihydroindene	0.50 J	5.0	ng/L	SW846 8270A SIM
Benzo(b)thiophene	0.071 J	0.90	ng/L	SW846 8270A SIM
Indole	0.44 J	2.5	ng/L	SW846 8270A SIM
Biphenyl	1.0 J	4.3	ng/L	SW846 8270A SIM
Dibenzothiophene	0.24 J	1.1	ng/L	SW846 8270A SIM
Acridine	2.3 J	6.1	ng/L	SW846 8270A SIM
Benzo(e)pyrene	0.039 J	1.9	ng/L	SW846 8270A SIM
Quinoline	1.6 J	6.9	ng/L	SW846 8270A SIM

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EXECUTIVE SUMMARY - Detection Highlights

D8K040108

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GAC-SLP4TLE-110398 11/03/98 005				
Acenaphthylene	1.7 J	2.8	ng/L	SW846 8270A SIM
Naphthalene	2.8 J	13	ng/L	SW846 8270A SIM
2-Methylnaphthalene	2.3 J	7.8	ng/L	SW846 8270A SIM
Acenaphthene	110	2.6	ng/L	SW846 8270A SIM
Dibenzofuran	1.2 J	2.0	ng/L	SW846 8270A SIM
Fluorene	1.1 J	2.0	ng/L	SW846 8270A SIM
Phenanthrene	7.4	2.6	ng/L	SW846 8270A SIM
Anthracene	1.6 J	5.4	ng/L	SW846 8270A SIM
Carbazole	23	3.8	ng/L	SW846 8270A SIM
Fluoranthene	13	6.2	ng/L	SW846 8270A SIM
Pyrene	12	2.8	ng/L	SW846 8270A SIM
Benzo(a) anthracene	0.067 J	5.0	ng/L	SW846 8270A SIM
Chrysene	0.11 J	5.6	ng/L	SW846 8270A SIM
Benzo(b) fluoranthene	0.12 J	5.0	ng/L	SW846 8270A SIM
Benzo(k) fluoranthene	0.11 J	4.6	ng/L	SW846 8270A SIM
Indene	5.5	1.8	ng/L	SW846 8270A SIM
1-Methylnaphthalene	1.4 J	5.6	ng/L	SW846 8270A SIM
2,3-Benzofuran	0.88 J	10 ,	ng/L	SW846 8270A SIM
2,3-Dihydroindene	99	10	ng/L	SW846 8270A SIM
Benzo(b) thiophene	17	1.8	ng/L	SW846 8270A SIM
Indole	0.83 J	5.0	ng/L	SW846 8270A SIM
Biphenyl	110	8.6	ng/L	SW846 8270A SIM
Dibenzothiophene	1.4 J	2.2	ng/L	SW846 8270A SIM
Acridine	5.8 J	12	ng/L	SW846 8270A SIM
Quinoline	4.6 J	14	ng/L	SW846 8270A SIM
GAC-SLP10T-110398 11/03/98 006	417			·
Acenaphthylene	1.2 J	1.4	ng/L	SW846 8270A SIM
Naphthalene	1.7 J	6.5	ng/L	SW846 8270A SIM
2-Methylnaphthalene	1.8 J	3.9	ng/L	SW846 8270A SIM
Acenaphthene	5.9	1.3	ng/L	SW846 8270A SIM
Dibenzofuran	1.2	1.0	ng/L	SW846 8270A SIM
Fluorene	4.0	1.0	ng/L	SW846 8270A SIM
Phenanthrene	3.9	1.3	ng/L	SW846 8270A SIM
Anthracene	0.54 J	2.7	ng/L	SW846 8270A SIM
Carbazole	0.22 J	1.9	ng/L	SW846 8270A SIM
Fluoranthene	2.9 Ј	3.1	ng/L	SW846 8270A SIM
Pyrene	3.3	1.4	ng/L	SW846 8270A SIM
Benzo(a) anthracene	0.097 J	2.5	ng/L	SW846 8270A SIM
Chrysene	0.066 J	2.8	ng/L	SW846 8270A SIM
Benzo (b) fluoranthene	0.055 J	2.5	ng/L	SW846 8270A SIM
Benzo (k) fluoranthene	0.050 J	2.3	ng/L	SW846 8270A SIM
	 -		5/ —	

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EXECUTIVE SUMMARY - Detection Highlights

D8K040108

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
GAC-SLP10T-110398 11/03/98 006				
Benzo(a)pyrene	0.045 J	2.3	ng/L	SW846 8270A SIM
Indene	0.31 J	0.90	ng/L	SW846 8270A SIM
1-Methylnaphthalene	0.96 J	2.8	ng/L	SW846 8270A SIM
2,3-Benzofuran	0.32 J	5.1	ng/L	SW846 8270A SIM
2,3-Dihydroindene	2.0 J	5.0	ng/L	SW846 8270A SIM
Benzo(b)thiophene	0.36 J	0.90	ng/L	SW846 8270A SIM
Indole	0.12 J	2.5	ng/L	SW846 8270A SIM
Biphenyl	5.9	4.3	ng/L	SW846 8270A SIM
Dibenzothiophene	0.92 J	1.1	ng/L	SW846 8270A SIM
Acridine	2.5 J	6.1	ng/L	SW846 8270A SIM
Benzo(e)pyrene	0.037 J	1.9	ng/L	SW846 8270A SIM
Quinoline	1.0 J	6.9	ng/L	SW846 8270A SIM
	4,			

ANALYTICAL METHODS SUMMARY

D8K040108

PARAMETER ANALYTICAL METHOD

Base/Neutrals and Acids SW846 8270A SIM

References:

SW846

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

METHOD / ANALYST SUMMARY

D8K040108

ANALYTICAL		ANALYST
METHOD	ANALYST	ID
SW846 8270A SIM	Phil Anderson	008918

References:

SW846

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

D8K040108

WO # S	SAMPLE	CLIENT SAMPLE ID	DATE TIME
			an landar
CN40E	001	GAC-SLP4T-110398	11/03/98
CN40N	002	GAC-SLP4TD-110398	11/03/98
CN40Q	003	GAC-SLP4TFB-110398	11/03/98
CN40R	004	GAC-SLP4TFBD-110398	11/03/98
CN40V	005	GAC-SLP4TLE-110398	11/03/98
CN410	006	GAC-SLP10T-110398	11/03/98

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

Client Sample ID: GAC-SLP4T-110398

GC/MS Semivolatiles

Lot-Sample #: D8K040108-001	Work Order #:	CN40E101	Matrix: WATER
Date Sampled: 11/03/98	Date Received:	11/04/98	
Prep Date: 11/06/98	Analysis Date:		
Prep Batch #: 8313367	Analysis Time:		
Dilution Factor: 1	•		
	Method:	SW846 8270	A SIM
DA DAMPHED	DECITE III	REPORTING	INITEG
PARAMETER	RESULT	LIMIT	UNITS
Acenaphthylene	0.58 J	1.4	ng/L
Naphthalene	2.8 J	6.5	ng/L
2-Methylnaphthalene	2.6 J	3.9	ng/L
Acenaphthene Dibenzofuran	20	1.3	ng/L
	0.93 J	1.0	ng/L
Fluorene Phenanthrene	0.96 J	1.0	ng/L
Anthracene	5.7 0.50 J	1.3	ng/L
Carbazole	3.3	2.7	ng/L
Fluoranthene	3.3	1.9 3.1	ng/L
-	2.5	1.4	ng/L
Pyrene Benzo(a)anthracene	0.062 J	2.5	ng/L ng/L
Chrysene	0.096 J	2.8	ng/L
Benzo (b) fluoranthene	0.094 J	2.5	ng/L
Benzo (k) fluoranthene	0.084 J	2.3	ng/L
Benzo (a) pyrene		2.3	 -
Indeno(1,2,3-cd)pyrene	0.073 J ND	2.1	ng/L
Benzo (ghi) perylene			ng/L
Indene	0.12 J 1.2	2.8 0.90	ng/L
1-Methylnaphthalene	1.5 J	2.8	ng/L
2,3-Benzofuran	0.28 J	5.1	ng/L ng/L
2,3-Dihydroindene	20	5.0	ng/L
Benzo (b) thiophene	2.8	0.90	ng/L
Indole	0.37 J	2.5	ng/L
Biphenyl	20	4.3	ng/L
Dibenzothiophene	0.58 J	1.1	ng/L
Acridine	3.0 J	6.1	
+-+			ng/L
Benzo (e) pyrene	0.063 J	1.9	ng/L
Perylene	ND	2.5	ng/L
Quinoline	2.4 J	6.9	ng/L
Dibenz (a, h) anthracene	ND	1.6	ng/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	
Chrysene-d12	47	(10 - 118)	
Fluorene d-10	86	(41 - 162)	
Naphthalene-d8	63	(21 - 108)	•

J Estimated result. Result is less than RL.

NOTE(S):

Client Sample ID: GAC-SLP4TFB-110398

GC/MS Semivolatiles

Lot-Sample #: D8K040108-003 Date Sampled: 11/03/98 Prep Date: 11/06/98 Prep Batch #: 8313367 Dilution Factor: 1	Work Order #: Date Received: Analysis Date: Analysis Time:	11/04/98 12/04/98	Matrix: WATER
2220200 200001 2	Method:	SW846 8270	A SIM
		REPORTING	
PARAMETER	RESULT	LIMIT	UNITS
Acenaphthylene	0.23 J	1.4	ng/L
Naphthalene	2.0 J	6.5	ng/L
2-Methylnaphthalene	1.7 J	3.9	ng/L
Acenaphthene	1.2 J	1.3	ng/L
Dibenzofuran	0.29 J	1.0	ng/L
Fluorene	0.61 J	1.0	ng/L
Phenanthrene	4.1	1.3	ng/L
Anthracene	0.34 J	2.7	ng/L
Carbazole	0.12 J	1.9	ng/L
Fluoranthene	1.6 J	3.1	ng/L
Pyrene	1.1 Ј	1.4	ng/L
Benzo(a)anthracene	0.055 J	2.5	ng/L
Chrysene	0.10 J	2.8	ng/L
Benzo (b) fluoranthene	0.085 J	2.5	ng/L
Benzo(k)fluoranthene	0.077 J	2.3	ng/L
Benzo(a)pyrene	0.068 J	2.3	ng/L
Indeno(1,2,3-cd)pyrene	ND	2.1	ng/L
Benzo(ghi)perylene	0.060 J	2.8	ng/L
Indene	0.31 J	0.90	ng/L
1-Methylnaphthalene	0.80 J	2.8	ng/L
2,3-Benzofuran	0.33 J	5.1	ng/L
2,3-Dihydroindene	0.60 J	5.0	ng/L
Benzo(b)thiophene	0.055 J	0.90	ng/L
Indole	0.31 J	2.5	ng/L
Biphenyl	1.2 J	4.3	ng/L
Dibenzothiophene	0.27 J	1.1	ng/L
Acridine	2.5 J	6.1	ng/L
Benzo (e) pyrene	0.058 J	1.9	ng/L
Perylene	0.048 J	2.5	ng/L
Quinoline	1.1 J	6.9	ng/L
Dibenz(a,h)anthracene	ND	1.6	ng/L
	PERCENT	RECOVERY	·
SURROGATE	RECOVERY	LIMITS	_
Chrysene-d12	67	(10 - 118)	
Fluorene d-10	118	(41 - 162)	
Naphthalene-d8	47	(21 - 108)	

J Estimated result. Result is less than RL.

NOTE(S):

Client Sample ID: GAC-SLP4TFBD-110398

GC/MS Semivolatiles

Lot-Sample #: D8K040108-004	Work Order #:		Matrix WATER
Date Sampled: 11/03/98	Date Received:		
Prep Date: 11/06/98	Analysis Date:	12/04/98	
Prep Batch #: 8313367	Analysis Time:	04:19	
Dilution Factor: 1	•		
	Method:	SW846 8270	A SIM
		REPORTING	
PARAMETER	RESULT	LIMIT	UNITS
Acenaphthylene	0.20 J	1.4	ng/L
Naphthalene	1.9 J	6.5	ng/L
2-Methylnaphthalene	1.6 J	3.9	ng/L
Acenaphthene	1.0 J	1.3	ng/L
Dibenzofuran	0.29 J	1.0	ng/L
Fluorene	0.56 J	1.0	ng/L
Phenanthrene	3.5	1.3	ng/L
Anthracene	0.25 J	2.7	ng/L
Carbazole	0.16 J	1.9	ng/L
Fluoranthene	1.5 J	3.1	ng/L
Pyrene	0.86 J	1.4	ng/L
Benzo (a) anthracene	0.049 J	2.5	ng/L
Chrysene	0.090 J	2.8	ng/L
Benzo (b) fluoranthene	0.083 J	2.5	ng/L
Benzo (k) fluoranthene	0.075 J	2.3	ng/L
Benzo (a) pyrene	0.062 J	2.3	ng/L
Indeno(1,2,3-cd)pyrene	ND	2.1	ng/L
Benzo(ghi)perylene	ND	2.8	ng/L
Indene	0.26 J	0.90	ng/L
1-Methylnaphthalene	0.71 J	2.8	ng/L
2,3-Benzofuran	0.29 J	5.1	ng/L
2,3-Dihydroindene	0.50 J	5.0	ng/L
Benzo (b) thiophene	0.071 J	0.90	ng/L
Indole	0.44 J	2.5	ng/L
Biphenyl.	1.0 J	4.3	ng/L
Dibenzothiophene	0.24 J	1.1	ng/L
Acridine	2.3 J	6.1	ng/L
Benzo(e)pyrene	0.039 J	1.9	ng/L
Perylene	ND	2.5	ng/L
Quinoline	1.6 J	6.9	ng/L
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	
Chrysene-d12	79	(10 - 118)	•
Fluorene d-10	94	(41 - 162)	
Naphthalene-d8	53	(21 - 108)	
_			
NOTE(S):			

J Estimated result. Result is less than RL.

Client Sample ID: GAC-SLP4TLE-110398

GC/MS Semivolatiles

Lot-Sample #: D8K040108-005 Date Sampled: 11/03/98 Prep Date: 11/06/98 Prep Batch #: 8313367 Dilution Factor: 2	Work Order #: Date Received: Analysis Date: Analysis Time:	11/04/98 12/04/98	Matrix: WATER
	Method:	SW846 8270	A SIM
PARAMETER	DECIII T	REPORTING LIMIT	UNITS
Acenaphthylene	RESULT 1.7 J	2.8	ng/L
	2.8 J	13	ng/L
Naphthalene	2.3 J	7.8	ng/L
2-Methylnaphthalene	110	2.6	ng/L
Acenaphthene		2.0	_
Dibenzofuran	1.2 J 1.1 J	2.0	ng/L
Fluorene Phenanthrene	7.4	2.6	ng/L
			ng/L
Anthracene	1.6 J	5.4	ng/L
Carbazole	23	3.8	ng/L
Fluoranthene	13	6.2	ng/L
Pyrene	12	2.8	ng/L
Benzo (a) anthracene	0.067 J	5.0	ng/L
Chrysene	0.11 J	5.6	ng/L
Benzo (b) fluoranthene	0.12 J	5.0	ng/L
Benzo(k) fluoranthene	0.11 J	4.6	ng/L
Benzo(a) pyrene	ND	4.6	ng/L
Indeno (1,2,3-cd) pyrene	ND 	4.2	ng/L
Benzo(ghi)perylene	ND_	5.6	ng/L
Indene	5.5	1.8	ng/L
1-Methylnaphthalene	1.4 J	5.6	ng/L
2,3-Benzofuran	0.88 J	10	ng/L
2,3-Dihydroindene	99	10	ng/L
Benzo (b) thiophene	17	1.8	ng/L
Indole	0.83 J	5.0	ng/L
Biphenyl	110	8.6	ng/L
Dibenzothiophene	1.4 J	2.2	ng/L
Acridine	5.8 มี	12	ng/L
Benzo(e)pyrene	ND	3.8	ng/L
Perylene	ND	5.0	ng/L
Quinoline	4.6 J	14	ng/L
Dibenz (a, h) anthracene	ND	3.2	ng/L
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS	
Chrysene-d12	40	(10 - 118)	-
Fluorene d-10	68	(41 - 162)	
Naphthalene-d8	56	(21 - 108)	
- ·		(== 200)	
NOTE(S):			

J Estimated result. Result is less than RL.

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Client Sample ID: GAC-SLP10T-110398

GC/MS Semivolatiles

Lot-Sample #: D8K040108-006	Work Order #:		Matrix WATER
Date Sampled: 11/03/98	Date Received:	11/04/98	
Prep Date: 11/06/98	Analysis Date:	12/04/98	
Prep Batch #: 8313367	Analysis Time:	05:29	
Dilution Factor: 1			
	Method:	SW846 8270	A SIM
		REPORTING	
PARAMETER	RESULT	LIMIT	UNITS
Acenaphthylene	1.2 J	1.4	ng/L
Naphthalene	1.7 J	6.5	ng/L
2-Methylnaphthalene	1.8 J	3.9	ng/L
Acenaphthene	5.9	1.3	ng/L
Dibenzofuran	1.2	1.0	ng/L
Fluorene	4.0	1.0	ng/L
Phenanthrene	3.9	1.3	ng/L
Anthracene	0.54 J	2.7	ng/L
Carbazole	0.22 J	1.9	ng/L
Fluoranthene	2.9 J	3.1	ng/L
Pyrene	3.3	1.4	ng/L
Benzo (a) anthracene	0.097 J	2.5	ng/L
Chrysene	0.066 J	2.8	ng/L
Benzo (b) fluoranthene	0.055 J	2.5	ng/L
Benzo (k) fluoranthene	0.050 J	2.3	ng/L
Benzo (a) pyrene	0.045 J	2.3	ng/L
Indeno(1,2,3-cd)pyrene	ND	2.1	ng/L
Benzo (ghi) perylene	ND	2.8	ng/L
Indene	0.31 J	0.90	ng/L
1-Methylnaphthalene	0.96 J	2.8	ng/L
2,3-Benzofuran	0.32 Ј	5.1	ng/L
2,3-Dihydroindene	2.0 J	5.0	ng/L
Benzo (b) thiophene	0.36 J	0.90	ng/L
Indole	0.12 J	2.5	ng/L
Biphenyl	5.9	4.3	ng/L
Dibenzothiophene	0.92 J	1.1	ng/L
Acridine	2.5 J	6.1	ng/L
Benzo (e) pyrene	0.037 J	1.9	ng/L
Perylene	ND	2.5	ng/L
Quinoline	1.0 J	6.9	ng/L
Dibenz (a, h) anthracene	ND	1.6	ng/L
(,,			5, =
	PERCENT	RECOVERY	
SURROGATE	RECOVERY	LIMITS	_
Chrysene-d12	35	(10 - 118)	- ·
Fluorene d-10	79	(41 - 162)	
Naphthalene-d8	51	(21 - 108)	
-		ŕ	
NOTE(S):			

 $[\]label{eq:continuous} J \quad \text{Estimated result. Result is less than } RL.$



Polynuclear Aromatic Hydrocarbons Method 8270B

Client Name: City of St. Louis Park Client ID: PCJ-SLP4F-042898

060158-0001-SA Lab ID:

Sampled: 28 APR 98 Received: 29 APR 98 Prepared: 03 MAY 98 Analyzed: 22 MAY 98 AQUEOUS Matrix: Authorized: 29 APR 98

Parameter	Result	Units	Reporting Limit	•
Parameter 2,3-Benzofuran 2,3-Dihydroindene Indene Naphthalene Benzo(b)thiophene Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene Biphenyl Acenaphthylene Acenaphthene Dibenzofuran Fluorene Dibenzothiophene Phenanthrene Anthracene Acridine Carbazole Fluoranthene Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(b)fluoranthene Benzo(c)pyrene Benzo(a)pyrene Perylene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene	ND 160 7.2 ND 27 ND	Units ng/L ng/L ng/L ng/L ng/L ng/L ng/L ng/	21 20 3.6 26 3.6 28 10 16 11 17 5.7 5.3 4.1 4.5 5.3 11 25 7.7 13 5.7 10 11 10 9.3 7.7 9.3 10 8.5 6.5	В
Benzo(g,h,i)perylene	ND .	ng/L	11	
Surrogate	Recovery		Limits	
Naphthalene-d8 Fluorene-d10 Chrysene-d12	69 69 56	% % %	21-108 41-162 10-118	

Dilution factor is 4.1. All results and limits are corrected for dilution.

 $\mbox{\bf B} = \mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf ND} = \mbox{\bf Not}$ Detected

Reported By: Tom Claeys

Approved By: Mary Helen Kelan



Polynuclear Aromatic Hydrocarbons Method 8270B

Client Name: City of St. Louis Park Client ID: PCJ-SLP10F-042898 Lab ID: 060158-0002-SA

AQUEOUS Sampled: 28 APR 98 Received: 29 APR 98 Prepared: 03 MAY 98 Analyzed: 22 MAY 98 Matrix: Authorized: 29 APR 98

Parameter	Result	Units	Reporting Limit	
2,3-Benzofuran	ND	ng/L	48	
2.3-Dihydroindene	290	ng/L	47	
Indene	12	ng/L	8.5	
Naphthalene	ND	ng/L	62	
Benzo(b)thiophene	50	ng/L	8.5	
Quinoline	ND	ng/L	65	
1H-Indole	ND	ng/L	24	
2-Methylnaphthalene	ND	ng/L	37	
1-Methylnaphthalene	ND	ng/L	27	
Biphenyl	ND	ng/L	41	
Acenaphthylene	130	ng/L	13	
Acenaphthene	590	ng/L	12	_
Dibenzofuran	34	ng/L	9.5	B B
Fluorene	200	ng/L	9.5	В
Dibenzothiophene	29	ng/L	10	В
Phenanthrene	ND	ng/L	12	
Anthracene	ND	ng/L	26	
Acridine	ND	ng/L	58	
Carbazole	ND	ng/L	18	
Fluoranthene	47	ng/L	29	В
Pyrene	79	ng/L	13	B
Benzo(a)anthracene	ND	ng/L	24	
Chrysene	ND	ng/L	27	
Benzo(b)fluoranthene	ND	ng/L	24	
Benzo(k)fluoranthene	ND ND	ng/L	22 18	
Benzo(e)pyrene	ND ND	ng/L	22	
Benzo(a)pyrene Perylene	ND ND	ng/L	22 24	
Indeno(1,2,3-cd)pyrene	ND ND	ng/L ng/L	24 20	
Dibenz(a,h)anthracene	ND ND	ng/L	20 15	
Benzo(g,h,i)perylene	ND ND	ng/L	27	
benzo(g,n, r)per grene	·	119/L	21	
Surrogate	Recovery		Limits	
Naphthalene-d8	NC	*	21-108	
Fluorene-d10	NC	% % %	41-162	
Chrysene-d12	NC	*	10-118	
-				

Dilution factor is 9.5. All results and limits are corrected for dilution.

 $\mbox{\bf B}=\mbox{\bf Compound}$ is also detected in the blank. $\mbox{\bf NC}=\mbox{\bf Not}$ Calculated, calculation not applicable. $\mbox{\bf ND}=\mbox{\bf Not}$ Detected

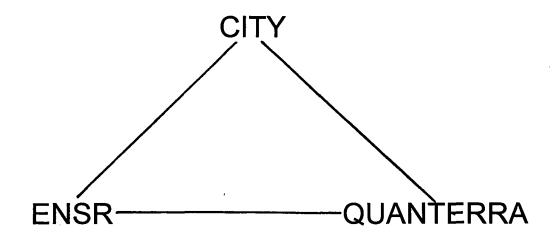
Reported By: Tom Claeys

Approved By: Mary Helen Kelan

ANNUAL PERFORMANCE REPORT GRANULAR ACTIVATED CARBON TREATMENT SYSTEM FOR 1997

REILLY TAR & CHEMICAL CORP.
N.P.L. SITE
ST. LOUIS PARK, MINNESOTA

SUBMITTED MARCH 15, 1998





UTILITY OPERATIONS

CERTIFIED MAIL RETURN RECEIPT REQUESTED

March 15, 1998

Regional Administrator
United States Environmental
Protection Agency, Region 5
ATTN: Darryl Owens

Mail Code 5HS-11 230 S. Dearborn Street Chicago, Illinois 60604

President
Reilly Industries, Inc.
300 N. Meridian #1500
Indianapolis, Indiana 46204

Director, Groundwater and Solid
Waste Division
Minnesota Pollution Control Agency
ATTN: Site Response Section
520 Lafayette Road North
ST. Paul, Minnesota 55155

Commissioner
Minnesota Department of Health
121 E. Seventh Place
P.O. Box 64975
St. Paul, MN 55164-0975

RE: United States of America, et al. vs Reilly Tar & Chemical Corporation, et al. File No. Civ. 4-80-469
CD-RAP 4.3.5

Gentleman:

Enclosed is the 1997 annual performance report of the Granular Activated Carbon treatment system submitted pursuant to Section 4.3.5. of the Consent Decree-Remedial Action Plan in the above captioned matter. This report is issued by the City in accordance with Section 2(a) of the Reilly/St. Louis Park Agreement (Exhibit B to the Consent Decree).

Sincerely,

Scott E. Anderson

Superintendent of Utilities

enclosure SEA/pmm

CC:

William Gregg (w/ enclosures)

Tom Scott (w/o enclosures)

Reilly File

RAP/anrapgac

ANNUAL PERFORMANCE REPORT FOR GRANULAR ACTIVATED CARBON TREATMENT SYSTEM - 1997

Operation:

The City operated the Granular Activated Carbon (GAC) treatment system in substantial compliance with Section 4.2 of the Remedial Action Plan (RAP) during 1997, treating 148.590 million gallons (mg) of water pumped from well SLP 10. On September 4, 1996 the treatment plant was taken off line due to the repair work on the ground reservoir. The repair work precluded the use of the ground reservoir, hence the treated water could not be added to the distribution system. The repair work on the reservoir was completed in August. To comply with the minimum pumping requirements established in Section 4.2.1 of the RAP, the minimum 10 million gallon per month volume pumped from well SLP 10 during the months of March, April, May, June and July was discharged to the surface water system.

During the months of January and February the GAC system was completely off line and no water was pumped from SLP 10 or SLP 15 due to the reconditioning project at the iron removal plant. The GAC system receives water from Water Treatment Plant No. 1, a sand filter system for iron removal located adjacent to the GAC treatment plant. The sand filter system was taken off line for major rehabilitation of the sand filters. The piping system does not allow water to be pumped directly from SLP 10 or SLP 15 to the GAC plant. Therefore the required production for SLP 10 or SLP 15 cannot be accomplished when the sand filters are off line for maintenance purposes. The major rehabilitation of the sand filters is completed once every fifteen years. The rehabilitation project is scheduled to be completed in March, 1997. The minimum annual pumpage volume for 1997 is expected to be met after the system is fully operational.

The annual monthly pumpages are shown in Table 1 which confirms the City was in substantial compliance with RAP Section 4.2.1 (i.e. a minimum of 200 mg must be pumped from SLP 10/15 annually and 10 mg must be pumped monthly).

Monitoring:

The 1997 monitoring program was jointly conducted by the City and Quanterra Environmental Services (Quanterra). The City retrieved all samples and Quanterra was responsible for analytical services. Laboratory analyses were conducted at the Quanterra laboratory in Arvada, Colorado.

The 1997 monitoring schedule (Table 2), as established in the 1997 Sampling Plan developed in accordance with the requirements of Section 3.3 of the RAP, provided for quarterly monitoring of the treatment system effluent and annual monitoring of the treatment system feed water, acid fraction analysis and extended PAH compounds. All samples were collected an analyzed in compliance with the CD-RAP. A summary of the 1997 GAC treatment system monitoring is shown in Table 3. All monitoring results indicate the GAC treatment system operated in compliance with the Drinking Water Criteria established in CD-RAP Section 2.2.

ADDITIONAL INFORMATION

The CD-RAP provides the operational criteria for the GAC facility located adjacent to Water Treatment Plant No. 1, located at 2936 Idaho Avenue (GAC-1) which treats water produced by municipal wells SLP 10 and SLP 15. The City constructed an additional GAC facility in 1994 located at 4701 West 41st Street (GAC-2) which treats water from municipal well SLP 4. This GAC facility is not referenced in the CD-RAP.

The City operates the GAC-2 facility within the Drinking Water Criteria established in Section 2.2. The facility is operated on a continuous pumping schedule as directed by the United States Environmental Protection Agency and the Minnesota Pollution Control Agency. The system is operated in a series of two sets of two GAC vessels. The lead units are referred to in the sample analysis as GAC-SLP4TLE. Samples are taken at the effluent of the lead vessels for operational purposes. When the sample results of the lead vessels exceed the Drinking Water Criteria the GAC is changed out. The lead vessels were changed out on May 7, 1997. After the change out the new GAC is then put in the lag position. The second set of vessels was changed out on December 5, 1997.

The results of the facility effluent are included in Table 3 of this report.

The GAC-2 facility treated 550.111 million gallons of water in 1997. The annual monthly pumpages are shown in Table 4.

CITY ST. LOUIS PARK GRANULAR ACTIVATED CARBON TREATMENT PLANT GAC 1

1997 PRODUCTION

	Volume
	Million Gallons
January	0.000
February	0.000
March	10.302
April	10.690
May	10.160
June	10.654
July	10.060
August	22.345
September	22.723
October	16.452
November	12.864
December	22.340
TOTAL ANNUAL PUMPAGE	148.590

Pumped to Surface Waters

1997 Sampling Plan GAC Treatment System Monitoring Schedule

RAP Section	Sampling Points	Start of Monitoring	Sample Frequency	Analyses
4.3.1(C)	Treated Water (TRTD)	Date of plan approval	Quarterly	PAH (ppt)
4.3.3(D)	Feed Water (FEED)	Date of plan approval	Annually	PAH (ppt)
4.3.4	Treated Water	Date of plan approval	Annually	*** Extended PAh (ppt)
4.3.4	Treated or Feed Water	Date of plan approval	Annually	Acid Fraction compounds in EPA Test Method 625

^{***} Extended list is incorporated in the 4th quarter sample

GAC PLANT		SLP4T	SLP10T	SLP4T	SLP10T	SLP4T	SLP10T	SLP4T	SLP10T
DATE		2/24/97	2/24/97	5/13/97	5/13/97	8/25/97	8/25/97	10/7/97	10/7/97
2,3-Benzofuran									
2,3-Dihydroindene		11	N		N	5.2		13	14
1H-Indene		1.3	0		0				
Naphthalene			Т		Т				
Benzo (b) Thiophene		2.2						2.2	
1H-Indole		T'	Α		Α				
2-Methylnaphthalene			V		V				
1-Methylnaphthalene			Α		Α				
Biphenyl			ı		1				
Acenaphthylene			L		L				
Acenaphthene		9.3	Α		Α	5.2		12	6.5
Dibenzofuran			В	1	В				
Fluorene		0.99	L	1.2	L				2
Dibenzothiophene			E		E				
Phenanthrene		5.6	1	5.4		3.2	2.1	3.1	2
Anthracene			0	<u> </u>	0				
Acridine			F		F			 	
Carbazole	\vdash		F	,	F			1.9	
Fluoranthene			··		•				
Pyrene		1.7	L		L				
12-Dimethylbenz(a)anthracene		2	ī						-
Benzo (e) Pyrene		_	N		N				
Perylene	H		E		E				
3-Methylcholanthrene	H								
Dibenz (A,C) Anthracene		4			 			 	
	_								
Quinoline	С	0		0		0	0	0	0
Benzo (a) Anthracene	С	0		0		0	0		0
Chrysene	С	0		0		0	0	0	0
Benzo (b) Fluoranthene	C	0		0		0	0	0	0
Benzo (k) Fluoranthene	С	0		0		0	0	0	0
Benzo (a) Pyrene	С	0		0		0	0	0	0
Indino (1,2,3-cd) Pyrene	C	0		0		0	0	0	
Dibenz (a,h) Anthracene	С	0		0		0	0	0	0
Benzo (g,h,i) Perylene	С	0		0		0	0	0	0
TOTAL OTHER PAH		34.09		7.6		13.6	2.1	32.2	24.5
BENO(a)PYRENE + DIBENZO(A,H)	С	0		0		0	0	0	0
TOTAL CARCINOGEN	С	0		0		0	0	0	0
TOTAL PAH		34.09		7.6		13.6	2.1	32.2	24.5
Dilution Factor		1		1		1	1	1	1
Surrogate Recoveries									
Naphthalene-d8		102		85		62	62	85	74
Fluorene-d10		98		73		33	81		35
Chrysene-d12		39		46		81	L		70

GAC PLANT	GAC	SLP4D	SLP10
DATE	FEED	4/14/97	9/23/97
2,3-Benzofuran			
2,3-Dihydroindene		200	360
1H-Indene		13	15
Naphthalene			-
Benzo (b) Thiophene		62	59
1H-Indole	<u> </u>		
2-Methylnaphthalene			
1-Methylnaphthalene			
Biphenyl			
Acenaphthylene		3.3	180
Acenaphthene	<u> </u>	230	760
Dibenzofuran			25
Fluorene			260
Dibenzothiophene	1	2.3	34
Phenanthrene	1	8.5	15
Anthracene			
Acridine			
Carbazole		41	
Fluoranthene		20	53
Pyrene		16	98
12-Dimethylbenz(a)anthracene			
Benzo (e) Pyrene			
Perylene			
3-Methylcholanthrene			
Dibenz (A,C) Anthracene			
Quinoline		0	0
Benzo (a) Anthracene		0	0
Chrysene		0	0
Benzo (b) Fluoranthene		0	0
Benzo (k) Fluoranthene		0	0
Benzo (a) Pyrene		0	0
Indino (1,2,3-cd) Pyrene		0	0
Dibenz (a,h) Anthracene		0	0
Benzo (g,h,i) Perylene		0	0
TOTAL OTHER PAH	<u> </u>	596.1	1859
BENO(a)PYRENE + DIBENZO(A,H)		0	0
TOTAL CARCINOGEN		0 500.4	0
TOTAL PAH		596.1	1859
Dilution Factor		2	10
Surrogate Recoveries	<u> </u>	400	
Naphthalene-d8		102	7
Fluorene-d10	<u> </u>	102	6
Chrysene-d12		40	0

CITY ST. LOUIS PARK GRANULAR ACTIVATED CARBON TREATMENT PLANT GAC 4

1997 PRODUCTION

	Volume
	Million Gallons
January	46.900
February	44.188
March	47.358
April	45.318
May	47.323
June	46.220
July	50.033
August	43.243
September	48.803
October	51.576
November	49.433
December	29.716
TOTAL ANNUAL PUMPAGE	550.111

FIRST QUARTER MONITORING



Quanterra Incorporated 4955 Yarrow Street Arvada, Colorado 80002

303 421-6611 Telephone 303 431-7171 Fax

CASE NARRATIVE

FOR

City of St. Louis Park

March 28, 1997

Quanterra Environmental Services

Project Number 053893

Introduction

Six aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on February 25, 1997. The samples were logged in under Quanterra Denver's project number 053893. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1997 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

The surrogate compound naphthalene-d8 in the LCS is reported at 111% recovery which is outside the 21% to 108% acceptance criteria. All samples associated with this LCS has their surrogate recoveries within acceptable limits.

The spike compound benzo (e) pyrene in both the matrix spike and matrix spike duplicate samples had "0%" recovery. Benzo (e) pyrene was recovered within acceptable limits in the LCS. A matrix effect is indicated.



With the exception of the above, this data package is in compliance with the terms and conditions of the October 1997 QAPP, both technically and for completeness, for other than the conditions detailed above.

Reported By:

Kurt C'. Ill

Program Manager

SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date T	Received ime Date
053893-0001-SA	GAC-SLP4T-022497	AQUEOUS	24 FEB 97	25 FEB 97
053893-0001-DU	GAC-SLP4TD-022497	AQUEOUS	24 FEB 97	25 FEB 97
053893-0001-MS	GAC-SLP4TMS-022497	AQUEOUS	24 FEB 97	25 FEB 97
053893-0001-SD	GAC-SLP4TMSD-022497	AQUEOUS	24 FEB 97	25 FEB 97
053893-0002-FB	GAC-SLP4TFB-022497	AQUEOUS	24 FEB 97	25 FEB 97
053893-0002-FD	GAC-SLP4TFBD-022497	AQUEOUS	24 FEB 97	25 FEB 97

ANALYTICAL TEST REQUESTS for City of St. Louis Park

Page 1 of 1

Lab ID: 053893	Group Code	Analysis Description		
0001 - 0002,	Α	Polynuclear Aromatic Hydrocarbons	N	
0002		Prep - PAH Semivolatile Organics by GC/MS, 5	N	

Tab Name: QUANTERRA DENVER Contract:

b Code: Case No.: 53893 SAS No.: SDG No.: 53893

Matrix: (soil/water) WATER Lab Sample ID: 53893-01

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0301623

Level: (low/med) LOW Date Received: 02/25/97

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/27/97

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 03/07/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) NG/L

CAS NO.	COMPOUND	dg/H OF dg/K	g/ NG/11	×
271_89_6	2,3-Benzofuran		4.8	U
496-11-7	2,3-Dihydroindene_		11	
95-13-6	1H-Indene		1.3 6.2 2.2 6.6 2.4 3.7 2.7 4.1	
91-20-3	Naphthalene		6.2	Ū
95-15-8	Benzo(b)thiophene_		2.2	
91-22-5	Ouinoline		6.6	Ū
120-72-9	Quinoline IH-Indole		2.4	บ
91-57-6	2-Methylnaphthalen	e	3.7	ប
90-12-0	2-Methylnaphthalen	e	2.7	บ
92-52-4	Biphenyl		4.1	ับ
208-96-8	Acenaphthylene		1.3	U
83-32-9	Acenaphthene Dibenzofuran		9.3	
132-64-9	Dibenzofuran		0.95	Ū
86-73-7	Fluorene		0.99	
132-65-0	Dibenzothiophene			
	Phenanthrene		5.6	В
120-12-7	Anthracene		2.6	U
260-94-6	Acridine		5.8	U
86-74-8	Carbazole		1.8	บ
206-44-0	Fluoranthene		3.0	U
129-00-0	Pyrene		1.7	В
56-55-3	Benzo (a) Anthracene		2.4	U
218-01-9	Chrysene		2.7	Ŭ
207-08-9	Benzo(b) fluoranthe	ne	2.4	บ
205-08-9	Benzo(k) fluoranthe	ne	1.0 5.6 8.8 1.7 2.4 2.2 1.2 2.4 2.4 2.0	U
192-97-2	Benzo(e)pyrene		1.8	U
50-32-8	Benzo(a)pyrene		2.2	U
198-55-0	Pervlene		2.4	U
193-39-5	Indeno(1,2,3-cd)py Dibenzo(a,h)anthra	rene	2.0	U
53-70-3	Dibenzo(a,h)anthra	cene	1.5	שׁו
191-24-2	Benzo(g,h,i)peryle	ne	2.7	U

FORM I SV-1

OLM03.0

GAC-SLP4TD

Lab Name: QUANTERRA DENVER Contract:

Lab Code:

Case No.: 53893 SAS No.:

SDG No.: 53893

Matrix: (soil/water) WATER

Lab Sample ID: 53893-01DU

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0401624

CONCENTRATION UNITS:

Injection Volume: 1.0(uL)

Date Received: 02/25/97

Level: (low/med) LOW

% Moisture: ____ decanted: (Y/N)___ Date Extracted: 02/27/97

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 03/07/97

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	(ug/L or	ug/Kg)	NG/L	Q	
496-11-7 95-13-6 91-20-3 91-20-3 91-22-5 120-72-9 91-57-6 92-52-4 208-96-8 132-64-9 86-73-7 132-65-0 120-12-7 260-94-6 260-94-6 260-94-6 207-08-9 207-08-9 207-08-9 192-97-2 50-32-8 193-39-5 193-39-5	-Naphthalene -Benzo (b) thiophene -Quinoline -1H-Indole -2-Methylnaphthale -1-Methylnaphthale -Biphenyl -Acenaphthylene -Acenaphthene -Dibenzofuran -Fluorene -Dibenzothiophene -Phenanthrene -Artidine -Carbazole -Fluoranthene -Pyrene -Benzo (a) Anthracer -Chrysene -Benzo (b) fluoranth -Benzo (c) pyrene -Benzo (a) pyrene -Benzo (a) pyrene	ene		4.8 11 1.2 6.2 2.6 6.4 3.7 2.7 4.1 1.3 9.2 0.95 0.95 1.0 3.9 5.8 3.0 1.4 2.7 2.4 2.2 2.4 2.2 2.4 2.5	ממממממממממממממ מממממ ט	
					I	1

1B SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

GAC-SLP4TFB

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 53893 SAS No.: SDG No.: 53893

Matrix: (soil/water) WATER

Lab Sample ID: 53893-02FB

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: A0701627

CONCENTRATION UNITS:

Level: (low/med) LOW

Date Received: 02/25/97

% Moisture: ____ decanted: (Y/N)__ Date Extracted:02/27/97

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 03/07/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND (u	g/L or 1	ıg/Kg)	NG/L	Q
271-89-6	2,3-Benzofuran			4.8	U
	2,3-Dihydroindene		-	4.8	ប
	1H-Indene	-	_	1.3	
91-20-3	Naphthalene		-	7.4	
	Benzo (b) thiophene		-	0.86	Ū
91-22-5	Quinoline			6.6	
	IH-Indole			2.4	
	2-Methylnaphthalene			5.0	
90-12-0	1-Methylnaphthalene		<u> </u>	2.7	
92-52-4		•	_	4.1	Ū
	Acenaphthylene			1.3	
	Acenaphthene		-	1.2	
	Dibenzofuran		- 1	1.4	
86-73-7		-	_	1.4	
	Dibenzothiophene		-	1.0	
85-01-8	Phenanthrene		_i	8.5	В
120-12-7	Anthracene			2.6	υ
260-94-6	Acridine		_	5.8	ט
86-74-8	Carbazole		_	1.8	ប
	Fluoranthene			3.0	
129-00-0	Pyrene			2.5	
	Benzo(a) Anthracene_			2.4	
218-01-9	Chrysene			2.7	
207-08-9	Benzo(b) fluoranthen	e	<u>_</u>	2.4	
205-08-9	Benzo(k) fluoranthen	e		2.2	U
192-97-2	Benzo(e)pyrene		_}	1.8	Ū
50-32-8	Benzo(a)pyrene		_1	2.2	U
198-55-0	Perylene		_[2.4	U
193-39-5	Indeno (1,2,3-cd) pyr	ene	_1	2.0	
53-70-3	Dibenzo(a,h)anthrac	ene		1.5	U
191-24-2	Benzo(g,h,i)perylen	e	_	2.7	
			!		

GAC-SLP4TFBD

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 53893 SAS No.:

SDG No.: 53893

Matrix: (soil/water) WATER

Lab Sample ID: 53893-02FD

Sample wt/vol:

4200 (g/ml) ML

Lab File ID: A0801628

Level: (low/med) LOW

Date Received: 02/25/97

% Moisture: ____ decanted: (Y/N)___

Date Extracted: 02/27/97

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 03/07/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

CONCENTRATION UNITS:

GPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	(ug/L or ug/		Q
496-11-7 95-13-6 91-20-3 95-15-8 91-22-5 120-72-9 91-57-6 92-52-4 208-96-8 132-64-9 132-65-0 132-65-0 120-12-7 260-94-6 260-94-6 260-94-6 129-00-0 56-55-3 218-01-9 207-08-9 207-08-9 192-97-2 50-32-8 193-39-5 193-39-5	AcenaphthyleneAcenaphtheneDibenzofuranFluoreneDibenzothiophePhenanthreneAcridineCarbazoleFluorantheneBenzo(a)AnthraChryseneBenzo(b)fluoraBenzo(c)pyrene	d) pyrene thracene	4.8 4.8 4.4 7.8 6.4 0.6 2.4 5.7 4.3 1.4 1.4 1.0 1.6 8.8 1.0 2.4 2.4 2.4 2.4 2.5 1.7	ממממממממממממממ מממם מממ מ
I		l		I{

GAC-SLP4TMS

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 53893 SAS No.:

SDG No.: 53893

Matrix: (soil/water) WATER

Lab Sample ID: 53893-01MS

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: A0501625

CONCENTRATION UNITS:

(ug/L or ug/Kg) NG/L

Level: (low/med) LOW

Date Received: 02/25/97

Q

% Moisture: decanted: (Y/N)

Date Extracted: 02/27/97

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 03/07/97

Injection Volume: 1.0(uL)

CAS NO.

COMPOUND

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

		·
271-89-6	·2,3-Benzofuran	4.8 U
	2,3-Dihydroindene	9.8
	1H-Indene	8.8
	Naphthalene	11
	Benzo (b) thiophene	2.0
	Ouinoline	10
	1H-Indole	2.4 0
	2-Methylnaphthalene	10
	1-Methylnaphthalene	2.7 0
92-52-4		- 4.1 U
	Acenaphthylene	1.3 0
	Acenaphthene	8.3
	Dibenzofuran	0.95 0
	Fluorene	8.5
132-65-0	Dibenzothiophene	1.0 0
	Phenanthrene	4.8 B
120-12-7	Anthracene	_ 2.6 ປັ
260-94-6	Acridine	5.8 U
86-74-8	Carbazole	1.8 U
206-44-0	Fluoranthene	3.0 U
129-00-0		1.4 B
56-55-3	Benzo(a) Anthracene	2.4 U
218-01-9	Chrysene	3.6
	Benzo(b) fluoranthene	2.4 U
	Benzo(k) fluoranthene	_ 2.2 U
192-97-2	Benzo(e)pyrene	_ 1.8 U
	Benzo(a)pyrene	2.2 U
	Perylene	2.4 U
193-39-5	Indeno(1,2,3-cd)pyrene	_ 2.0 ប
	Dibenzo(a,h)anthracene	_ 1.5 ប
191-24-2	Benzo(g,h,i)perylene	_ 2.7 บ
		

GAC-SLP4TMSD

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 53893 SAS No.: SDG

SAS No.: SDG No.: 53893

Matrix: (soil/water) WATER Lab Sample ID: 53893-01MSD

Sample wt/vol: 4200 (g/ml) ML Lab File ID: A0601626

Level: (low/med) LOW Date Received: 02/25/97

% Moisture: ____ decanted: (Y/N)__ Date Extracted:02/27/97

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 03/07/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
CAS NO. COMPOUND (ug/L or ug/Kg) NG/L Q

	COMPOUND	(ug/L or ug/Kg)	NG/ LI	Q
496-11-7 95-13-6 91-20-3 91-22-5 120-72-9 90-12-0 92-52-4 208-96-8 83-32-9 132-64-9 86-73-7 132-65-0 85-01-8 260-94-6 260-94-6 260-44-0 129-00-0 56-55-3	2,3-Benzofuran2,3-Dihydroinde1H-IndeneNaphthaleneBenzo(b)thiopheQuinoline1H-Indole2-Methylnaphthal1-MethylnaphthalBiphenylAcenaphthyleneDibenzofuranFluoreneDibenzothiophenePhenanthreneArtidineCarbazoleFluoranthenePyreneBenzo(a)AnthraceChrysene	ne	4.8 11 9.8 13 2.1 11 2.4 12 2.7 4.1 1.3 8.7 0.95 9.1 1.0 4.6 5.8 1.8 3.0 1.3 2.4 3.4	ממממממשם מ מממ
86-73-7 132-65-0 85-01-8 120-12-7 260-94-6 86-74-8 206-44-0 129-00-0 56-55-3 218-01-9 207-08-9 205-08-9 192-97-2 50-32-8 193-39-5 53-70-3	FluoreneDibenzothiophenePhenanthreneAnthraceneAcridineCarbazoleFluoranthenePyreneBenzo(a) AnthraceBenzo(b) fluorantBenzo(k) fluorantBenzo(e) pyreneBenzo(a) pyrene	ene thene thene pyrene tracene	9.1 1.0 4.6 2.6 5.8 1.8 3.0 1.3 2.4	ממממממ ממממממשם

SECOND QUARTER MONITORING



Quanterra Incorporated 4955 Yarrow Street Arvada, Colorado 80002

303 421-6611 Telephone 303 431-7171 Fax

CASE NARRATIVE

FOR

City of St. Louis Park

July 8, 1997

Quanterra Environmental Services

Project Number 055164

Introduction

Seven aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on April 22, 1997. The samples were logged in under Quanterra Denver's project number 055164. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1996 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

The surrogate compound chrysene-d12 was recovered at 122% in the method blank. Surrogate limits for chrysene-d12 are 10% to 118%. Chrysene was recovered in all associated samples and the LCS within acceptance limits. The data is not effected.

The spike compound benzo (e) pyrene was not recovered in either the matrix spike or matrix spike cuplicate samples. Benzo (e) pyrene was recovered within acceptance limits in the LCS. Matrix effect is indicated.



Except for the above, this data package is in compliance with the terms and conditions of the October 1996 QAPP, both technically and for completeness

Kurt C. Ill Program Manager



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

			Sampl	ed	Received
Lab ID	Client ID	Matrix	Date	Time	Date
055164-0001-SA	GAC-SLP4T-051397	AQUEOUS	13 MAY 97		14 MAY 97
055164-0001-DU	GAC-SLP4TD-051397	AQUEOUS	13 MAY 97		14 MAY 97
055164-0001-MS	GAC-SLP4TMS-051397	AQUEOUS	13 MAY 97	<u>'</u> .	14 MAY 97
055164-0001-SD	GAC-SLP4TMSD-051397	AQUEOUS	13 MAY 97		14 MAY 97
055164-0002-FB	GAC-SLP4TFB-051397	AQUEOUS	13 MAY 97	1	14 MAY 97
055164-0002-FD	GAC-SLP4TFBD-051397	AQUEOUS	13 MAY 97		14 MAY 97
055164-0003-SA	GAC-SLP4TLE-051397	AQUEOUS	13 MAY 97		14 MAY 97



ANALYTICAL TEST REQUESTS for City of St. Louis Park

Page 1 of 1

Lab ID: 055164	Group Code	Analysis Description	Custom Test?
0001 - 0003	Α	Polynuclear Aromatic Hydrocarbons Prep - PAH Semivolatile Organics by GC/MS, 5	N N
0002	В	Polynuclear Aromatic Hydrocarbons Prep - PAH Semivolatile Organics by GC/MS, 5	N N

EPA SAMPLE NO.

GAC-SLP4T Contract: Lab Name: Case No.: 55164 SAS No.: SDG No.: 55164 Lab Code: Matrix: (soil/water) WATER . Lab Sample ID: 55164-01 Sample wt/vol: 4185 (g/ml) ML Lab File ID: C0109 Date Received: 05/14/97 Level: (low/med) LOW % Moisture: decanted: (Y/N)___ Date Extracted: 05/15/97 0.5(ml)Concentrated Extract Volume: Date Analyzed: 06/16/97 Dilution Factor: 1.0 Injection Volume: 1.0(uL)

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) NG/L Q

271-89-6			
496-11-72,3-Dihydroindene 4.8 U 95-13-6	271 80 6 2 2 Bongofuran	1 0	TT
95-13-6	406-11-72,3-Dihydroindene		_
91-20-3Naphthalene 6.2 U 95-15-8Benzo(b)thiophene 0.86 U 91-22-5Quinoline 6.6 U 120-72-91H-Indole 2.4 U 91-57-62-Methylnaphthalene 3.7 U 90-12-01-Methylnaphthalene 2.7 U 92-52-4Biphenyl 4.1 U 208-96-8Acenaphthylene 1.3 U 83-32-9Acenaphthene 1.2 U 132-64-9Dibenzofuran 1.0 U 86-73-7	05 12.6 1V-Indone		
95-15-8			
91-22-5			
120-72-91H-Indole			_
91-57-62-Methylnaphthalene 3.7 U 90-12-01-Methylnaphthalene 2.7 U 92-52-4Biphenyl 4.1 U 208-96-8Acenaphthylene 1.3 U 83-32-9Acenaphthylene 1.0 U 83-32-9			_
90-12-01-Methylnaphthalene 2.7 U 92-52-4Biphenyl 4.1 U 208-96-8Acenaphthylene 1.3 U 83-32-9Acenaphthene 1.2 U 132-64-9Dibenzofuran 1.0 U 86-73-7Fluorene 1.0 U 85-01-8Phenanthrene 5.4 U 120-12-7Anthracene 2.6 U 260-94-6		_ 1	•
92-52-4	91-5/-62-MetnyInaphthalene		
208-96-8		_	_
1.2 U 132-64-9Dibenzofuran 1.0			
132-64-9	208-96-8Acenaphthylene		_
86-73-7	83-32-9Acenaphthene	- 1 - 4	U
132-65-0			
86-74-8Carbazole 1.8 U 206-44-0Fluoranthene 3.0 U 129-00-0Pyrene 1.3 U 56-55-3Benzo (a) Anthracene 2.4 U 218-01-9Chrysene 2.7 U 207-08-9Benzo (b) fluoranthene 2.4 U 205-08-9Benzo (c) pyrene 1.8 U 192-97-2Benzo (c) pyrene 1.8 U 50-32-8Benzo (a) pyrene 2.2 U 198-55-0Perylene 2.4 U 193-39-5Indeno (1, 2, 3-cd) pyrene 2.0 U 53-70-3Dibenzo (a, h) anthracene 1.5 U		- 1 - 2	
86-74-8Carbazole 1.8 U 206-44-0Fluoranthene 3.0 U 129-00-0Pyrene 1.3 U 56-55-3Benzo (a) Anthracene 2.4 U 218-01-9Chrysene 2.7 U 207-08-9Benzo (b) fluoranthene 2.4 U 205-08-9Benzo (c) pyrene 1.8 U 192-97-2Benzo (c) pyrene 1.8 U 50-32-8Benzo (a) pyrene 2.2 U 198-55-0Perylene 2.4 U 193-39-5Indeno (1, 2, 3-cd) pyrene 2.0 U 53-70-3Dibenzo (a, h) anthracene 1.5 U	132-65-0Dibenzothiophene	-1	U
86-74-8Carbazole 1.8 U 206-44-0Fluoranthene 3.0 U 129-00-0Pyrene 1.3 U 56-55-3Benzo (a) Anthracene 2.4 U 218-01-9Chrysene 2.7 U 207-08-9Benzo (b) fluoranthene 2.4 U 205-08-9Benzo (c) pyrene 1.8 U 192-97-2Benzo (c) pyrene 1.8 U 50-32-8Benzo (a) pyrene 2.2 U 198-55-0Perylene 2.4 U 193-39-5Indeno (1, 2, 3-cd) pyrene 2.0 U 53-70-3Dibenzo (a, h) anthracene 1.5 U		5.4	
86-74-8Carbazole 1.8 U 206-44-0Fluoranthene 3.0 U 129-00-0Pyrene 1.3 U 56-55-3Benzo (a) Anthracene 2.4 U 218-01-9Chrysene 2.7 U 207-08-9Benzo (b) fluoranthene 2.4 U 205-08-9Benzo (c) pyrene 1.8 U 192-97-2Benzo (c) pyrene 1.8 U 50-32-8Benzo (a) pyrene 2.2 U 198-55-0Perylene 2.4 U 193-39-5Indeno (1, 2, 3-cd) pyrene 2.0 U 53-70-3Dibenzo (a, h) anthracene 1.5 U		2.6	Ü
206-44-0Fluoranthene 3.0 U 129-00-0Pyrene 1.3 U 56-55-3Benzo(a) Anthracene 2.4 U 218-01-9Chrysene 2.7 U 207-08-9Benzo(b) fluoranthene 2.4 U 205-08-9Benzo(k) fluoranthene 2.2 U 192-97-2Benzo(e) pyrene 1.8 U 50-32-8Benzo(a) pyrene 2.2 U 198-55-0		_ 5.8	<u> </u>
129-00-0			_
56-55-3Benzo (a) Anthracene 2.4 U 218-01-9Chrysene 2.7 U 207-08-9Benzo (b) fluoranthene 2.4 U 205-08-9Benzo (k) fluoranthene 2.2 U 192-97-2Benzo (e) pyrene 1.8 U 50-32-8Benzo (a) pyrene 2.2 U 198-55-0Perylene 2.4 U 193-39-5Indeno (1, 2, 3-cd) pyrene 2.0 U 53-70-3Dibenzo (a, h) anthracene 1.5 U			
218-01-9Chrysene 2.7 U 207-08-9Benzo(b) fluoranthene 2.4 U 205-08-9Benzo(k) fluoranthene 2.2 U 192-97-2Benzo(e) pyrene 1.8 U 50-32-8Benzo(a) pyrene 2.2 U 198-55-0Perylene 2.4 U 193-39-5Indeno(1,2,3-cd) pyrene 2.0 U 53-70-3Dibenzo(a,h) anthracene 1.5 U		1.3	<u>U</u>
205-08-9Benzo (k) fluoranthene 2.2 U 192-97-2Benzo (e) pyrene 1.8 U 50-32-8Benzo (a) pyrene 2.2 U 198-55-0Perylene 2.4 U 193-39-5Indeno (1, 2, 3-cd) pyrene 2.0 U 53-70-3Dibenzo (a, h) anthracene 1.5 U		2.4	ט
205-08-9Benzo (k) fluoranthene 2.2 U 192-97-2Benzo (e) pyrene 1.8 U 50-32-8Benzo (a) pyrene 2.2 U 198-55-0Perylene 2.4 U 193-39-5Indeno (1, 2, 3-cd) pyrene 2.0 U 53-70-3Dibenzo (a, h) anthracene 1.5 U	218-01-9Chrysene	_[2.7	ט
192-97-2Benzo(e) pyrene 1.8 U 50-32-8Benzo(a) pyrene 2.2 U 198-55-0Perylene 2.4 U 193-39-5Indeno(1,2,3-cd) pyrene 2.0 U 53-70-3Dibenzo(a,h) anthracene 1.5 U		2.4	
50-32-8Benzo(a) pyrene 2.2 U 198-55-0Perylene 2.4 U 193-39-5Indeno(1,2,3-cd) pyrene 2.0 U 53-70-3Dibenzo(a,h) anthracene 1.5 U		2.2	
198-55-0Perylene 2.4 U 193-39-5Indeno(1,2,3-cd)pyrene 2.0 U 53-70-3Dibenzo(a,h)anthracene 1.5 U		1.8	Ŭ
193-39-5Dibenzo(a,h)anthracene 1.5 U		2.2	U
193-39-5Dibenzo(a,h)anthracene 1.5 U	198-55-0Perylene	2.4	U
53-70-3Dibenzo(a,h)anthracene 1.5 U	193-39-5Indeno(1,2,3-cd)pyrene	2.0	ļŪ
191-24-2Benzo(g,h,i)perylene 2.7 U	53-70-3Dibenzo(a,h)anthracene	1.5	U
	191-24-2Benzo(g,h,i)perylene	2.7	Ŭ

EPA SAMPLE NO.

 Lab Name:
 Contract:
 GAC-SLP4TD

 Lab Code:
 Case No.: 55164
 SAS No.: SDG No.: 55164

 Matrix: (soil/water) WATER
 Lab Sample ID: 55164-01DU

 Sample wt/vol:
 4195 (g/ml) ML
 Lab File ID: C0121

Level: (low/med) LOW Date Received: 05/14/97

% Moisture: ____ decanted: (Y/N)___ Date Extracted:05/15/97

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 06/17/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) NG/L Q

271-89-6	2,3-Benzofuran	4.9	U
496-11-7	2,3-Dihydroindene	- 4.8	
95-13-6	·1H-Indene	- 0.86	
	Naphthalene	6.2	
95-15-8	Benzo(b) thiophene	0.86	
91-22-5	Quinoline	- 6.6	
	·1H-Indole	- 2.4	
	2-Methylnaphthalene	$ \overline{3}.\overline{7}$	
90-12-0	1-Methylnaphthalene	2.7	ا ن ا
92-52-4	Biphenyl	4.1	Ū
208-96-8	Acenaphthylene	1.3	บั
83-32-9	Acenaphthene	1.2	ט
132-64-9	Dibenzofuran	0.95	
86-73-7	Fluorene	0.95	
	Dibenzothiophene	1.0	
85-01-8	Phenanthrene	4.9	
	Anthracene	4.9	<u> </u>
	Acridine	5.8	ן די ן
86-74-8	Carbazole	T 1 2	ltt l
206-44-0	Fluoranthene	3.0 1.3 2.4 2.7 2.4 2.7 2.4 2.2	ן מן
129-00-0	Pyrene	1.3	ן ט
56-55-3	Benzo(a) Anthracene	2.4	ן די
218-01-9	Chrysene	2.7	ן ט
207-08-9	Chrysene Benzo(b) fluoranthene	2.4	ן ש
205-08-9	Benzo(k) fluoranthene	2.2	ַ ט
192-97-2	Benzo(e)pyrene	1.8	U
50-32-8	Benzo(a)pyrene	2.2	Ŭ
198-55-0	Perylene	2.4	ט
193-39-5	Indeno(1,2,3-cd)pyrene	1.8 2.2 2.4 2.0	ַ
53-70-3	Dibenzo (a, h) anthracene	1.5	ן טן
191-24-2	Benzo(g,h,i)perylene	2.7	ע

GAC-SLP4TFB

Lab Name:

Contract:

그 가장 사람 기억 영화 최근 현재 경험...

Lab Code: Case No.: 55164 SAS No.: SDG No.: 55164

Matrix: (soil/water) WATER . Lab Sample ID: 55164-02FB

Sample wt/vol: 4160 (g/ml) ML Lab File ID: C0120

Level: (low/med) LOW Date Received: 05/14/97

% Moisture: decanted: (Y/N) Date Extracted:05/15/97

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 06/17/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) NG/L Q

4.9 U 271-89-6----2,3-Benzofuran 496-11-7-----2,3-Dihydroindene 4.8 U 0.86 U 91-20-3-----Naphthalene 6.2 U 0.86 U 95-15-8-----Benzo(b)thiophene 6.6 U 2.4 U 3.8 U 2.7 U 91-22-5-----Ouinoline 120-72-9-----IH-Indole 91-57-6----2-Methylnaphthalene 90-12-0----1-Methylnaphthalene 92-52-4-----Biphenyl 4.1 U 208-96-8-----Acenaphthylene 1.3 U 1.2 U 83-32-9-----Acenaphthene 0.96 U 132-64-9-----Dibenzofuran 0.96 U 86-73-7-----Fluorene 132-65-0-----Dibenzothiophene 1.0 U 2.3 85-01-8-----Phenanthrene 120-12-7-----Anthracene 5.9 U 260-94-6-----Acridine 86-74-8-----Carbazole 206-44-0----Fluoranthene 3.0 U 129-00-0-----Pyrene 2.4 U 2.7 U 56-55-3-----Benzo(a)Anthracene 218-01-9-----Chrysene 207-08-9-----Benzo(b) fluoranthene 2.4 U 2.2 U 205-08-9-----Benzo(k) fluoranthene 1.8 U 192-97-2----Benzo(e)pyrene 2.2 U 2.4 U 2.0 U 50-32-8-----Benzo(a)pyrene 198-55-0-----Perylene 193-39-5----Indeno(1,2,3-cd)pyrene_ 1.5 U 53-70-3-----Dibenzo(a,h)anthracene 2.7 0 191-24-2----Benzo(g,h,i)perylene

3/90

GAC-SLP4TFBD

Lab Name:

Contract:

Lab Code:

Case No.: 55164 SAS No.:

SDG No.: 55164

Matrix: (soil/water) WATER

Lab Sample ID: 55164-02FD

Sample wt/vol: 4165 (g/ml) ML

Lab File ID: C0111

Date Received: 05/14/97

Level: (low/med) LOW

% Moisture: ____ decanted: (Y/N)___

Date Extracted:05/15/97

CONCENTRATION UNITS:

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 06/16/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	(ug/L or	ug/Kg)	NG/L	Q
271-89-6 496-11-7 95-13-6 91-20-3 91-22-5 120-72-9 120-72-9 92-52-4 208-96-8 208-96-8 132-64-9 132-65-0 85-01-8 120-12-7 260-94-6 86-74-8 129-00-0 56-55-3 218-01-9 207-08-9 192-97-2 192-97-2 193-39-5 193-39-5	2,3-Benzofuran2,3-Dihydroinde1H-IndeneNaphthaleneBenzo(b)thiopheQuinoline1H-Indole2-Methylnaphtha1-MethylnaphthaBiphenylAcenaphthyleneDibenzofuranFluoreneDibenzothiopherPhenanthreneAcridineCarbazoleFluoranthene	ene ene alene alene cene thene althene althene althene althene		4.8 4.8 0.86 6.86 2.7 4.3 0.96 0.96 1.96 0.96 1.96	וממממממם מממממממממממ

GAC-SLP4TLE

Lab Name: Contract:

Lab Code: Case No.: 55164 SAS No.: SDG No.: 55164

Matrix: (soil/water) WATER Lab Sample ID: 55164-03

Sample wt/vol: 4190 (q/ml) ML Lab File ID: C0116

Level: (low/med) LOW Date Received: 05/14/97

% Moisture: ____ decanted: (Y/N) ___ Date Extracted:05/15/97

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 06/16/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) NG/L Q

271-89-6----2,3-Benzofuran 4.9 U 496-11-7----2,3-Dihydroindene____ 56 95-13-6-----1H-Indene_ 2.8 91-20-3----Naphthalene_ 6.2 U 95-15-8-----Benzo (b) thiophene 12 91-22-5-----Quinoline 120-72-9-----IH-Indole 6.6 U 2.4 U 91-57-6----2-Methylnaphthalene 3.7 0 90-12-0-----1-Methylnaphthalene____92-52-4-----Biphenyl____ 2.7 0 4.1 U 208-96-8-----Acenaphthylene 1.3 0 83-32-9-----Acenaphthene 44 132-64-9-----Dibenzofuran 0.95 U 86-73-7-----Fluorene 0.95 U 132-65-0-----Dibenzothiophene 85-01-8-----Phenanthrene 1.0 0 3.5 2.6 U 120-12-7-----Anthracene 260-94-6------Acridine 5.8 U 86-74-8-----Carbazole 4.7 206-44-0----Fluoranthene____ 3.0 ਹ 129-00-0-----Pyrene 1.7 56-55-3----Benzo(a)Anthracene 2.4 0 218-01-9-----Chrysene 207-08-9-----Benzo(b) fluoranthene 2.7 U 2.4 U 2.2 U 1.8 U 205-08-9-----Benzo(k) fluoranthene 192-97-2-----Benzo(e)pyrene_ 50-32-8-----Benzo(a)pyrene_ 2.2 0 198-55-0-----Perylene 193-39-5-----Indeno(1,2,3-cd)pyrene__ 2.4 U 2.0 0 53-70-3-----Dibenzo(a, h) anthracene 1.5 U 2.7 U 191-24-2-----Benzo(g,h,i)perylene

EPA SAMPLE NO.

GAC-SLP4TMS

Lab Name: Contract:

Lab Code: SDG No.: 55164 Case No.: 55164 SAS No.:

Matrix: (soil/water) WATER Lab Sample ID: 55164-01MS

Sample wt/vol: 4195 (g/ml) ML Lab File ID: C0114

Date Received: 05/14/97 Level: (low/med) LOW

% Moisture: decanted: (Y/N) Date Extracted: 05/15/97

Date Analyzed: 06/16/97 0.5(ml)Concentrated Extract Volume:

Dilution Factor: 1.0 Injection Volume: 1.0(uL)

pH: 7.0

GPC Cleanup: (Y/N) N

CONCENTRATION UNITS: CAS NO COMPOUND (ug/L or ug/Kg) NG/L

271-89-62, 3-Benzofuran 4.9 U 496-11-72, 3-Dihydroindene 4.8 U 95-13-61H-Indene 8.3 91-20-3Naphthalene 10 95-15-8Benzo(b) thiophene 0.86 U 91-22-5Quinoline 8.5 120-72-91H-Indole 2.4 U 91-57-62-Methylnaphthalene 9.3 90-12-01-Methylnaphthalene 9.3 90-12-01-Methylnaphthalene 2.7 U 208-96-8Acenaphthylene 1.3 U 208-96-8Acenaphthylene 1.2 U 132-64-9Dibenzofuran 0.95 U 132-64-9
218-01-9Chrysene 2.4 U

3/90

EPA SAMPLE NO.

GAC-SLP4TMSD

Lab Name:

Contract:

Lab Code: Case No.: 55164 SAS No.: SDG No.: 55164

Matrix: (soil/water) WATER Lab Sample ID: 55164-01SD

Sample wt/vol: 4195 (g/ml) ML Lab File ID: C0122

Level: (low/med) LOW Date Received: 05/14/97

% Moisture: ____ decanted: (Y/N)__ Date Extracted:05/15/97

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 06/17/97

Injection Volume: 1.0(uL) Dilution Factor: 1.0

• •

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS:

CAS NO. COMPOUND (ug/L or ug/Kg) NG/L Q

271-89-62,3-Benzofuran	4.9	Ū
496-11-72,3-Dihydroindene	4.8	Ū
95-13-61H-Indene	7.7	
91-20-3Naphthalene	11	
95-15-8Benzo(b) thiophene	0.86	Ū
91-22-5Quinoline	7.9	
120-72-91H-Indole	2.4	Ū
91-57-62-Methylnaphthalene	9.5	
90-12-01-Methylnaphthalene	9.5 2.7	T
92-52-4Biphenyl	4.1	IJ
208-96-8Acenaphthylene	1.3	U
83-32-9Acenaphthene	1.3	Ū
132-64-9Dibenzofuran	0.95	IJ
86-73-7Fluorene	9 6	
132-65-0Dibenzothiophene	1.0	TT
132-65-0Dibenzothiophene 85-01-8Phenanthrene	1.0 3.8 2.6 5.8 1.8 3.0	
120-12-7Anthracene	2 6	ĪĪ
260-94-6Acridine	5.8	τ
86-74-8	1.8	τī
206-44-0Fluoranthene	3 0	τī
129-00-0Pyrene	1.3	τī
56-55-3Benzo(a) Anthracene	2.4	
218-01-9Chrysene	4 0	١
207-08-9Benzo(b) fluoranthene	4.0	77
205-08-9Benzo(k) fluoranthene	2 2	111
192-97-2Benzo(e) pyrene	2.2	177
50-32-8Benzo(a) pyrene	7.0	11
198-55-0Perylene	2.2	111
193-39-5Indeno(1,2,3-cd)pyrene	2.0	111
53-70-3Dibenzo(a,h)anthracene	1.5	H
191-24-2Benzo(g,h,i)perylene	2.7	TT .
131-24-2	2./	٦
		· ——

WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name:

Contract:

Lab Code:

Case No.: 55164

SAS No.:

SDG No.: 55164

	EPA	S1	S2	S3	S4	S5	S6	S7	S8	TOT
	SAMPLE NO.	#	#	#	#	#	#	#	#	OUT
	========	=====	=====	=====	=====	=====	======	======	=====	===
01	LCS	84	114	72		,	j			
02	GAC-SLP4T	85	46	73						0
03	GAC-SLP4TFBD	88	98	75						o
04	GAC-SLP4TMS	79	85	67						ő
05	GAC-SLP4TLE	83	60	69						ŏ
06	SBLK01	82	122*	68						
07		77	124	60		l				0
	GAC-SLP4TFB		110	67]			0
08	GAC-SLP4TD	77	90	71						0
09	GAC-SLP4TMSD	92	92	77						0
- 10										
11				:						
12										
13										
14										
15										
16										
17										_
18										
19										—
20		. 								- 1
21						i				
22										-in-
22										
23										
24										
25										
11 13 14 15 17 18 19 22 22 22 22 22 23 23 20 30 30 30 30 30 30 30 30 30 30 30 30 30										
27										
28										
29										
30										
55				·	·	·	·			

QC LIMITS (21-108) = Naphthalene-d8 = Chrysene-d12 S1 (10-118)S2 = Fluorene-d10 (41-162)S3

D Surrogate diluted out

page 1 of 1

FORM II SV-1

3/90

[#] Column to be used to flag recovery values
* Values outside of contract required QC limits

THIRD QUARTER MONITORING



Quanterra Incorporated 4955 Yarrow Street Arvada, Colorado 80002

303 421-6611 Telephone 303 431-7171 Fax

CASE NARRATIVE

FOR

City of St. Louis Park

October 3, 1997

Quanterra Environmental Services

Project Number 056651

Introduction

Nine aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on August 26, 1997. The samples were logged in under Quanterra Denver's project number 056651. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH).

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1996 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

The spike compounds benzo (e) pyrene and crysene were not recovered in either the matrix spike or matrix spike duplicate samples. Benzo (e) pyrene and crysene were recovered within acceptance limits in the LCS. A matrix effect is indicated.



Except for the above, this data package is in compliance with the terms and conditions of the October 1996 QAPP, both technically and for completeness

Reported By:

/Kurt C. Ill

Program Manager

Date: 1997



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

	Oliver ID	Mahada	Sampled	Received
Lab ID	Client ID	Matrix	Date Time	Date
056651-0001-SA	GAC-SLP4T-082597	AQUEOUS	25 AUG 97	26 AUG 97
056651-0001-DU 056651-0001-MS	GAC-SLP4TD-082597 GAC-SLP4TMS-082597	AQUEOUS AQUEOUS	25 AUG 97 25 AUG 97	26 AUG 97 26 AUG 97
056651-0001-SD	GAC-SLP4TMSD-082597	AQUEOUS	25 AUG 97	26 AUG 97
056651-0002-SA 056651-0003-SA	GAC-SLP4TLE-082597 GAC-SLP10T-082597	AQUEOUS AQUEOUS	25 AUG 97 25 AUG 97	26 AUG 97 26 AUG 97
056651-0004-FB	GAC-SLP4TFB-082597	AQUEOUS	25 AUG 97	26 AUG 97
056651-0004-FD 056651-0005-SA	GAC-SLP4TFBD-082597 GAC-SLP6-082597	AQUEOUS AQUEOUS	25 AUG 97 25 AUG 97	26 AUG 97 26 AUG 97
000001 0000 0/1	# 14 4F1 4 44444.			



ANALYTICAL TEST REQUESTS for City of St. Louis Park

Page 1 of 1

Lab ID: 056651	Group Code	Analysis Description	Custom Test?
0001 - 0005	Α	Polynuclear Aromatic Hydrocarbons Prep - PAH Semivolatile Organics by GC/MS, 5	N N
0004	В	Polynuclear Aromatic Hydrocarbons Prep - PAH Semivolatile Organics by GC/MS, 5	N N

GAC-SLP4T

b Name: QUANTERRA DENVER Contract:

SDG No.: 56651

حمد Code:

Case No.: 56651 SAS No.:

Matrix: (soil/water) WATER

Lab Sample ID: 56651-01

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C0452

CONCENTRATION UNITS:

Level: (low/med) LOW

Date Received: 08/26/97

% Moisture: ____ decanted: (Y/N)___

Date Extracted: 08/26/97

Injection Volume: 1.0(uL)

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 09/03/97

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	(ug/L or ug/Kg)	NG/L	Q
271-89-6 496-11-7 95-13-6 91-20-3 91-22-5 120-72-9 91-57-6 90-12-0 92-52-4 208-96-8 132-64-9 132-65-0 85-01-8 120-12-7 260-94-6 86-74-8 206-44-0 129-00-0 56-55-3	2,3-Benzofuran2,3-Dihydroinde1H-IndeneNaphthaleneBenzo(b)thiopheQuinoline1H-Indole2-Methylnaphtha1-MethylnaphthaAcenaphthyleneAcenaphtheneDibenzofuranFluoreneDibenzothiophenPhenanthreneAnthraceneAcridineCarbazoleFluoranthenePyreneBenzo(a)Anthrac	ne leneeeene	4.8 5.86 0.86 6.86 2.7 4.1 3.2 0.1 2.6 8.8 1.3 2.7 4.3 2.6 8.8 1.3 2.7 2.7	ממממממממ מממממממ מ
56-55-3 218-01-9 207-08-9	Benzo (a) Anthrac Chrysene Benzo (b) fluoran	thene	2.4 2.7 2.4	ָ ט ט
192-97-2 50-32-8 198-55-0	Benzo(k) fluoran Benzo(e) pyrene Benzo(a) pyrene Perylene Indeno(1,2,3-cd		2.2 1.8 2.2 2.4 2.0	ם ם
53-70-3	Benzo(g,h,i)per	hracene	1.5	ן ט

GAC-SLP4TD

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 56651 SAS No.:

SDG No.: 56651

Matrix: (soil/water) WATER

Lab Sample ID: 56651-01DU

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C0453

Level: (low/med) LOW

Date Received: 08/26/97

% Moisture: ____ decanted: (Y/N) Date Extracted:08/26/97

Concentrated Extract Volume:

0.5(ml)

Date Analyzed: 09/03/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	CONCENTRA (ug/L or			Q
496-11-7- 95-13-6 91-20-3 91-20-3 91-22-5 120-72-9- 91-57-6 92-52-4 208-96-8- 83-32-9 132-64-9- 86-73-7 132-65-0- 85-01-8 120-12-7- 260-94-6- 86-74-8 129-00-0- 56-55-3 218-91-9- 207-08-9- 207-08-9- 205-08-9- 192-97-2- 50-32-8 193-39-5- 193-39-5- 53-70-3	2,3-Benzofuran2,3-Dihydroinde1H-IndeneBenzo(b)thiopheBenzo(b)thiopheQuinoline1H-Indole2-Methylnaphtha1-MethylnaphthaBiphenylAcenaphthyleneDibenzofuranFluoreneDibenzothiophenPhenanthreneArtidineCarbazoleFluorantheneBenzo(a)AnthracChryseneBenzo(b)fluoranBenzo(b)fluoranBenzo(c)pyreneBenzo(a)pyrene	ne		80626647713155506688034742824057	ממממממממממממממ ממממממממ

EPA SAMPLE NO.

GAC-SLP4TLE

Name: QUANTERRA DENVER

Contract:

Code:

Case No.: 56651 SAS No.:

SDG No.: 56651

Matrix: (soil/water) WATER

Lab Sample ID: 56651-02

Sample wt/vol:

Lab File ID: C0456

Level: (low/med)

4185 (g/ml) ML

Date Received: 08/26/97

% Moisture: ____ decanted: (Y/N)___

LOW

Date Extracted: 08/26/97

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 09/03/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS: COMPOUND CAS NO. (ug/L or ug/Kg) NG/L Q

271-89-62,3-Benzofuran 496-11-72,3-Dihydroindene 95-13-61H-Indene 91-20-3Naphthalene 95-15-8Benzo(b)thiophene 91-22-5Quinoline 120-72-91H-Indole 91-57-62-Methylnaphthalene 90-12-01-Methylnaphthalene 92-52-4Biphenyl 208-96-8Acenaphthylene 83-32-9Acenaphthene 132-64-9Dibenzofuran 86-73-7Fluorene 132-65-0Dibenzothiophene 85-01-8Phenanthrene 120-12-7Anthracene 260-94-6Acridine 86-74-8Carbazole 206-44-0Fluoranthene 129-00-0	4.9 89 5.2 6.6 21 6.6 2.7 4.1 1.3 110 0.96 0.96 1.0 7.9 2.4 2.7 2.4 2.7	ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט
129-00-0Pyrene 56-55-3Benzo (a) Anthracene 218-01-9Chrysene 207-08-9Benzo (b) fluoranthene	7.9 2.4 2.7 2.4	ט ט

GAC-SLP10T

Lab Name: QUANTERRA DENVER

Contract:

Lab Code: Case No.: 56651 SAS No.:

SDG No.: 56651

Matrix: (soil/water) WATER

Lab Sample ID: 56651-03

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C0457

Date Received: 08/26/97

% Moisture: ____ decanted: (Y/N)___

Level: (low/med) LOW

Date Extracted:08/26/97

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 09/03/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

271-89-62,3-Benzofuran 4.8 U 496-11-72,3-Dihydroindene 4.8 U 95-13-61H-Indene 0.86 U 91-20-3Naphthalene 0.86 U 95-15-8Benzo(b)thiophene 0.86 U 91-22-5Quinoline 6.6 U 120-72-9	CAS NO.	COMPOUND	CONCENTR (ug/L or			Q	
191-24-2Benzo(g,h,i)perylene	496-11-7 95-13-6 91-20-3 95-15-8 91-22-5 91-57-6 90-12-0 92-52-4 208-96-8 83-32-9 132-64-9 86-73-7 132-65-0 85-01-8 120-12-7 260-94-6 86-74-8 206-44-0 56-55-3 218-01-9 207-08-9 205-08-9 192-97-2 50-32-8 193-39-5 53-70-3	-2,3-Dihydroindene -1H-Indene -Naphthalene -Benzo(b)thiophene -Quinoline -1H-Indole -2-Methylnaphthale -1-Methylnaphthale -1-Methylnaphthale -Biphenyl -Acenaphthylene -Acenaphthene -Dibenzofuran -Fluorene -Dibenzothiophene -Phenanthrene -Anthracene -Acridine -Carbazole -Fluoranthene -Pyrene -Benzo(a)Anthracen -Benzo(b)fluoranth -Benzo(b)fluoranth -Benzo(c)pyrene -Benzo(a)pyrene -Perylene -Indeno(1,2,3-cd)p -Dibenzo(a,h)anthracen	ene	-	4.86266.4771.325550.16.880.3474.2824.05 0.000000000000000000000000000000000	מממממממממממממממממממממממממ	

EPA SAMPLE NO.

GAC-SLP4TFB

Tab Name: QUANTERRA DENVER Contract:

Code:

Case No.: 56651 SAS No.: SDG No.: 56651

Matrix: (soil/water) WATER

Lab Sample ID: 56651-04FB

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C0450

Date Received: 08/26/97

Level: (low/med) LOW

% Moisture: decanted: (Y/N)___ Date Extracted:08/26/97

CONCENTRATION UNITS:

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 09/03/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

CAS NO.	COMPOUND	(ug/L	or ug	/Kg)	NG/L		Ç	2
271-89-6 496-11-7 95-13-6 91-20-3 91-22-5 120-72-9 91-57-6 90-12-0 92-52-4 208-96-8 83-32-9 132-64-9 86-73-7 132-65-0 85-01-8 260-94-6 86-74-8 206-44-0 129-00-0 56-55-3	2,3-Benzofuran2,3-Dihydroinde1H-IndeneNaphthaleneBenzo(b)thiopheQuinoline1H-Indole2-Methylnaphtha1-MethylnaphthaAcenaphthyleneAcenaphtheneDibenzofuranFluoreneDibenzothiopherAcridineAcridineCarbazoleFluorantheneBenzo(a)Anthrace	ene	or ug	/Kg)	NG/L	4.8 4.8 6.8 6.8 6.3 6.4 7.7 4.3 1.9 9.9 1.6 6.8 8.3 1.2 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3	ממממממשמטממממממממממ	
56-55-3 218-01-9 207-08-9 205-08-9 192-97-2	Benzo(a)Anthrac Chrysene Benzo(b)fluorar Benzo(k)fluorar Benzo(e)pyrene	thene			·	2.4 2.7 2.4 2.2 1.8	מממממ	
50-32-8 198-55-0 193-39-5 53-70-3	Benzo (a) pyrene)pyrene_ hracene				2.2 2.4 2.0 1.5 2.7	บ บ	

GAC-SLP4TFBD

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 56651 SAS No.:

SDG No.: 56651

Matrix: (soil/water) WATER

Lab Sample ID: 56651-04FD

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C0451

CONCENTRATION UNITS:

Level: (low/med) LOW

Date Received: 08/26/97

% Moisture: _____ decanted: (Y/N)___

Date Extracted: 08/26/97

Concentrated Extract Volume:

0.5(ml)

Date Analyzed: 09/03/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 6.0

271-89-62,3-Benzofuran 4.8 U 496-11-72,3-Dihydroindene 4.8 U 95-13-61H-Indene 0.86 U 91-20-3Naphthalene 0.86 U 95-15-8

GAC-SLP4TMS

I Name: QUANTERRA DENVER Contract:

L Code:

Case No.: 56651 SAS No.:

SDG No.: 56651

Matrix: (soil/water) WATER

Lab Sample ID: 56651-01MS

Sample wt/vol:

4200 (g/ml) ML

Lab File ID:

C0454

CONCENTRATION UNITS:

Level: (low/med) LOW

Date Received: 08/26/97

% Moisture: ____ decanted: (Y/N)___

0.5(ml)

Date Extracted: 08/26/97

Concentrated Extract Volume:

Date Analyzed: 09/03/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.	COMPOUND	(ug/L or ug/Kg) NG/L	Q
496-11-7 95-13-6 91-20-3 91-22-5 120-72-9 91-57-6 90-12-0 92-52-4 208-96-8 83-32-9 132-64-9 86-73-7 132-65-0 85-01-8 260-94-6 86-74-8 206-44-0 129-00-0	COMPOUND 2,3-Benzofuran2,3-Dihydroinde1H-IndeneNaphthaleneBenzo(b)thiopheQuinoline1H-Indole2-Methylnaphtha1-MethylnaphthaBiphenylAcenaphthyleneAcenaphtheneDibenzofuranFluoreneDibenzothiophenPhenanthreneAridineCarbazoleFluoranthene	lene lene	4.8 4.8 6.6 8.0 0.86 7.2 2.4 8.7 2.7 4.1 1.3 4.7 0.95 9.3 1.0 2.6 5.8 1.8	ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט ט
85-01-8 120-12-7 260-94-6 86-74-8 206-44-0 129-00-0 56-55-3 218-01-9 207-08-9 205-08-9 192-97-2 50-32-8 193-39-5	PhenanthreneAnthraceneAcridineCarbazoleFluoranthene	thene thene	5.8 1.8	ממסממממממממ

GAC-SLP4TMSD

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 56651 SAS No.: SDG No.: 56651

Matrix: (soil/water) WATER

Lab Sample ID: 56651-01SD

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C0455

Level: (low/med) LOW

Concentrated Extract Volume: 0.5(ml)

Date Received: 08/26/97

% Moisture: ____ decanted: (Y/N) ___ Date Extracted:08/26/97

Date Analyzed: 09/03/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7.0

271-89-62,3-Benzofuran 4.8 U 496-11-72,3-Dihydroindene 5.0 95-13-61H-Indene 7.4 91-20-3Naphthalene 8.8 95-15-8Benzo(b) thiopnene 0.86	CAS NO.	COMPOUND	CONCENTR (ug/L or	 	Q
91-22-5	496-11-7 95-13-6 91-20-3 91-20-3 91-22-5 91-57-6 90-12-0 92-52-4 208-96-8 208-96-8 132-64-9 132-65-0 85-01-8 120-12-7 260-94-6 86-74-8 206-44-0 129-00-0 56-55-3 218-01-9 207-08-9 205-08-9 192-97-2 50-32-8 193-39-5 193-39-5	2,3-Dihydroind1H-IndeneNaphthaleneBenzo(b)thioprQuinoline1H-Indole2-Methylnaphth1-MethylnaphthBiphenylAcenaphtheneDibenzofuranFluoreneDibenzothiophePhenanthreneArtidineCarbazoleFluoranthenePyreneBenzo(a)AnthraBenzo(b)fluoraBenzo(b)fluoraBenzo(a)pyreneBenzo(a)pyreneBenzo(a)pyreneBenzo(a)pyrene	nenenalene	578.861487113450 0 8292415.910268803474282405 0 1325131222212221.5	מממממממממממ מ ממם מ ט

FOURTH QUARTER MONITORING



Quanterra Incorporated 4955 Yarrow Street Arvada, Colorado 80002

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CASE NARRATIVE

FOR

City of St. Louis Park

December 17, 1997

Quanterra Environmental Services

Project Number 057409

Introduction

Seven aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on October 8, 1997. The samples were logged in under Quanterra Denver's project number 057409. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for low level part-per-trillion (ppt) polynuclear aromatic hydrocarbons (PAH) extended list.

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1996 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

Fluorene was recovered at 120% in the Laboratory Control Sample (LCS) which is outside the 69% to 118% acceptance limits. Fluorene was recovered within acceptance limits for the matrix spike and matrix spike duplicate samples.

The relative percent difference (RPD) for the spike compounds quinoline and crysene are reported outside the 20% QC limits. All spike recoveries were within acceptance limits. Quinoline and chrysene were recovered within acceptance limits for the LCS.



The spike compound benzo (e) pyrene was recovered low in both the matrix spike and matrix spike duplicate sample. Benzo (e) pyrene was recovered within acceptance limits in the LCS. A matrix effect is indicated.

Except for the above, this data package is in compliance with the terms and conditions of the October 1996 QAPP, both technically and for completeness

Reported By:

Kurt C. Ill

Program Manager

Date: 12-17-97



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

			Sampled	Received
Lab ID	Client ID	Matrix	Date Time	Date
057409-0001-SA	GAC-SLP4TX-100797	GRND-H20	07 OCT 97	08 OCT 97
057409-0001-DU	GAC-SLP4TDEX-100797	GRND-H20	07 OCT 97	08 OCT 97
057409-0001-MS 057409-0001-SD	GAC-SLP4TMSEX-100797 GAC-SLP4TMSDEX-100797	GRND-H20 GRND-H20	07 OCT 97 07 OCT 97	08 OCT 97 08 OCT 97
057409-0001-FB	GAC-SLP4TFBEX-1007977	GRND-H20	07 OCT 97	08 OCT 97
057409-0001-FD	GAC-SLP4TFBDEX-100797	GRND-H20	07 OCT 97	08 OCT 97
057409-0002-SA	GAC-SLP10TEX-100797	GRND-H20	07 OCT 97	09 OCT 97



ANALYTICAL TEST REQUESTS for City of St. Louis Park

Page 1 of 1

Lab ID: 057409	Group Code	Analysis Description	Custom Test?
0001 , 0001, 0002	Α	Polynuclear Aromatic Hydrocarbons - Extended	N
0002		Prep - PAH Semivolatile Organics by GC/MS, 5	N
0001	В	Polynuclear Aromatic Hydrocarbons - Extended	N
		Prep - PAH Semivolatile Organics by GC/MS, 5	N

EPA SAMPLE NO.

GAC-SLP4TX

Lab Name: QUANTERRA

Contract:

Lab Code:

Case No.: 57409 SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-01

Sample wt/vol:

LOW

4200 (q/ml) ML

Lab File ID:

C1073

Level: (low/med)

Concentrated Extract Volume:

Date Received: 10/08/97

% Moisture: decanted: (Y/N)

0.5(ml)

Date Extracted:10/07/97 Date Analyzed: 11/11/97

Injection Volume:

CAS NO.

1.0(uL)

COMPOUND

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L

Q

		, . .	-
496-11-7 95-13-6 91-20-3	2,3-Benzofuran 2,3-Dihydroindene 1H-Indene Naphthalene Benzo(b)thiophene	4.8 13 0.86 6.2 2.2	
91-22-5 120-72-9 91-57-6 90-12-0 92-52-4	Quinoline 1H-Indole 2-Methylnaphthalene 1-Methylnaphthalene	6.6 2.4 3.7 2.7 4.1 1.3	บ บ
83-32-9 132-64-9 86-73-7 132-65-0 85-01-8	Acenaphthene	12 0.95 0.95 1.0 3.1 2.6	บ บ บ
260-94-6 86-74-8 206-44-0 129-00-0	AcridineCarbazoleFluoranthenePyreneBenzo(a)Anthracene	5.8 1.9 3.0 1.3 2.4 2.7	บ บ
207-08-9 205-08-9 192-97-2 50-32-8 198-55-0	Benzo(b) fluoranthene Benzo(k) fluoranthene Benzo(e) pyrene Benzo(a) pyrene	2.4 2.2 1.8 2.2 2.4	ם ם ם
53-70-3	Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	2.0 1.5 2.7	ט ט

EPA SAMPLE NO.

GAC-SLP4TX

Q

Lab Name: OUANTERRA Contract: Lab Code: Case No.: 57409 SAS No.: SDG No.: 57409 Matrix: (soil/water) WATER Lab Sample ID: 57409-01

Sample wt/vol: 4200 (g/ml) ML Lab File ID: C1073

Level: (low/med) Date Received: 10/08/97

decanted: (Y/N)____ Date Extracted:10/07/97 % Moisture:

Concentrated Extract Volume: 0.5(ml)Date Analyzed: 11/11/97

Dilution Factor: 1.0 Injection Volume: 1.0(uL)

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO.

CONCENTRATION UNITS:

COMPOUND

2.7 U 3.3 U 57-97-6-----7,12-Dimethylbenz(a)anthrace 56-49-5----3-Methylcholanthrene____

(ug/L or ug/Kg) NG/L

EPA SAMPLE NO.

GAC-SLP4TDEX

Lab Name: QUANTERRA

Contract:

Lab Code:

Case No.: 57409 SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-01DU

Sample wt/vol: 4200 (g/ml) ML Lab File ID: C1075

Level: (low/med) LOW

Date Received: 10/08/97

% Moisture: ____ decanted: (Y/N) ___ Date Extracted:10/07/97

Concentrated Extract Volume:

0.5(ml) Date Analyzed: 11/11/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

CONCENTRATION UNITS:

GPC Cleanup: (Y/N) N

pH: 7.0

CAS NO.	COMPOUND	(ug/L or	ug/Kg)	NG/L	Q
271-89-6	2,3-Benzofuran	L		4.8	U
496-11-/	2,3-Dihydroind	rerre		11	
	1H-Indene	.		0.86	
91-20-3	Naphthalene			6.2	יין
95-15-8	Benzo(b) thioph	iene		1.8 6.6 2.4 3.7 2.7	l <u></u>
91-22-5	Quinoline			6.6	<u> </u>
120-72-9	1H-Indole			2.4	U
91-57-6	2-Methylnaphth	alene		3.7	U
90-12-0	1-Methylnaphth	alene		2.7	U
92-52-4	Biphenyl			4.1	U
208-96-8	Acenaphthylene			1.3	U
83-32-9	Acenaphthene			11	
132-64-9	Dibenzofuran	· · · · · · · · · · · · · · · · · · ·		0.95	U
	Fluorene			0.95	
132-65-0	Dibenzothiophe	ne			
85-01-8	Dibenzothiophe Phenanthrene			3.2	1
120-12-7	Anthracene			2.6	Ī
260-94-6	Acridine			5 8	111
	Carbazole			1 8	١π
	Fluoranthene			3.0	Ιπ
129-00-0	Dyrene			1.4	١
56-55-3	Benzo(a)Anthra	cene		2.4	ļ rr
218-01-9	Chrysene	.cene		2.7	111
210-01-9	Benzo(b) fluora	nthene		2.7	1 11
207-00-9	Benzo(k) fluora	nthene	——I	2.4	1
102 07 2	Penne (c) numero	inchene		1.0	1 5
192-9/-2	Benzo(e)pyrene			1.0	₩
100 EE 0	Benzo(a) pyrene		 -I	1.0 3.2 2.6 5.8 1.8 3.0 1.4 2.7 2.4 2.2 1.8 2.2 2.4 2.0	1
178-35-0	Perylene		<u>—</u>]	2.4	1
TA3-3A-2	Indeno(1,2,3-c	apyrene		2.0	[, ,
53-70-3	Dibenzo(a,h) an	tnracene		1.5	
191-24-2	Benzo(g,h,i)pe	ryrene	1	2.7	U

EPA SAMPLE NO.

GAC-SLP4TDEX

Q

Lab Name: QUANTERRA Contract:

Case No.: 57409 SAS No.: SDG No.: 57409 Lab Code:

Lab Sample ID: 57409-01DU Matrix: (soil/water) WATER

Lab File ID: 4200 (g/ml) ML C1075 Sample wt/vol:

(low/med) Date Received: 10/08/97 Level: LOW

Date Extracted:10/07/97 decanted: (Y/N)____ % Moisture:

Date Analyzed: 11/11/97 Concentrated Extract Volume: 0.5(ml)

Dilution Factor: 1.0 Injection Volume: 1.0(uL)

GPC Cleanup: (Y/N) N pH: 7.0

> CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L CAS NO. COMPOUND

57-97-6----7,12-Dimethylbenz(a)anthrace 56-49-5----3-Methylcholanthrene 2.7 U

EPA SAMPLE NO.

GAC-SLP4TFBEX

Lab Name: QUANTERRA

Contract:

Lab Code:

Case No.: 57409

SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-01FB

Sample wt/vol:

4200 (g/ml) ML

Lab File ID:

C1066

Level:

(low/med)

LOW

Date Received: 10/08/97

% Moisture:

decanted: (Y/N)____

Date Extracted:10/09/97

Concentrated Extract Volume:

0.5(ml)

Date Analyzed: 11/11/97

Injection Volume: 1.0(uL)

COMPOTE

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 6.0

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or	ug/Kg)	NG/L	Q
271-89-6	2,3-Benzofuran_			4.8	Ū
496-11-7	2,3-Dihydroinder	ie .		4.8	
95-13-6	1H-Indene	· · · · · · · · · · · · · · · · · · ·		0.86	U
91-20-3	Naphthalene			. 6.2	U
95-15-8	Benzo(b)thiopher	ne .		0.86	
91-22-5	Quinoline			6.6	U
120-72-9	1H-Indole			2.4	U
91-57-6	2-Methylnaphthal 1-Methylnaphthal Biphenyl Acenaphthylene Acenaphthene	Lene	_	3.7	U
90-12-0	1-Methylnaphthal	Lene		2.7	บ
92-52-4	Biphenvl			4.1	U
208-96-8	Acenaphthylene		—	4.1 1.3	ប
83-32-9	Acenaphthene			1.2	U
132-64-9	Dibenzofuran		i	0.95	U
86-73-7	Fluorene			0.95	U
132-65-0	Dibenzothiophene	2		1.0	U
85-01-8	Dibenzothiophene Phenanthrene		— <u> </u>	1.9 2.6 5.8 1.3 2.4 2.7 2.4 2.2	
120-12-7	Anthracene			2.6	ט
260-94-6	Acridine			5.8	U
86-74-8	Carbazol e			1.8	U
206-44-0	Fluoranthene			3.0	U
129-00-0	Pyrene			1.3	U
56-55-3	Benzo (a) Anthrace	ene		2.4	U
218-01-9	Chrysene			2.7	Ū
207-08-9	Benzo(b) fluorant	hene		2.4	U
205-08-9	Benzo(k) fluorant	hene		2.2	Ŭ
192-97-2	Benzo(e)pyrene			1.8	U
50-32-8	Benzo(a)pyrene			2.2	U
198-55-0	Perylene —			1.8 2.2 2.4	U
193-39-5	Benzo(e)pyrene_ Benzo(a)pyrene_ Perylene Indeno(1,2,3-cd)	pyrene		2.0	U
53-70-3	Dibenzo(a,n)anti	nracene		1,.5	U
191-24-2	Benzo(g,h,i)pery	lene		2.7	บ
		-			

EPA SAMPLE NO.

Lab Name: QUANTERRA

Contract:

GAC-SLP4TFBEX

Lab Code:

Case No.: 57409

SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-01FB

Sample wt/vol: 4200 (g/ml) ML

Lab File ID:

Level:

(low/med)

LOW

Date Received: 10/08/97

decanted: (Y/N)

Date Extracted:10/09/97

Concentrated Extract Volume:

0.5(ml)

Date Analyzed: 11/11/97

Injection Volume:

1.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 6.0

CAS NO.

COMPOUND

CONCENTRATION UNITS:

(ug/L or ug/Kg) NG/L

0

57-97-6-----7,12-Dimethylbenz(a)anthrace 56-49-5----3-Methylcholanthrene

2.7 U 3.3 U

EPA SAMPLE NO.

GAC-SLP4TFBDEX

Lab Name: QUANTERRA

Contract:

Lab Code:

Case No.: 57409 SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-01FD

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C1067

Level: (low/med) LOW

Date Received: 10/08/97

% Moisture: ____ decanted: (Y/N)___ Date Extracted:10/09/97

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 11/11/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug	/kg) kg/L		Q
271-89-6	2,3-Benzofuran_			4.8	
496-11-7	2,3-Dihydroinde	ne	Í	4.8	
95-13-6	1H-Indene		ŀ	0.86	U
91-20-3	Naphthalene		I	6.2	
95-15-8	Benzo(b)thiopher	ne		0.86	U
91-22-5	Quinoline]	6.6	
	IH-Indole			2.4	U
91-57-6	2-Methylnaphtha	lene	}	3.7	U
90-12-0	1-Methylnaphtha	lene		2.7	U
92-52-4	Biphenvl		il .	4.1	U
208-96-8	Acenaphthylene		[1.3	U
83-32-9	Acenaphthene			1.2	U
132-64-9	Dibenzofuran		1	0.95	U
86-73-7	Fluorene			0.95	U
132-65-0	Dibenzothiophene	3	` }	1.0	U
85-01-8	Phenanthrene			2.2	
120-12-7	Anthracene			2.6	Ū
260-94-6	Acridine			5.8	U
86-74-8	Carbazole		'	1.8	U
206-44-0	Fluoranthene		'	3.0	U
129-00-0	Pvrene		` 	1.3	U
56-55-3	Benzo(a) Anthrace	ene	'	2.4	U
218-01-9	Chrysene		1	2.7	U
207-08-9	Chrysene Benzo(b) fluoran	hene	`	5.8 1.8 3.0 1.3 2.4 2.7	U
205-08-9	Benzo(k) fluoran	thene	` \	2.21	u
192-97-2	Benzo(e)pyrene_		·	1.8	Ū
50-32-8	Benzo(a)pyrene_		· J	2.2	Ŭ
198-55-0	Perylene		1	2.4	Ū
193-39-5	Indeno(1,2,3-cd)	pyrene	1	1.8 2.2 2.4 2.0	Ū
53-70-3	Dibenzo(a.h)antl	racene	1	1.5	Ū
191-24-2	Benzo(g,h,i)per	rlene	· \	2.7	TT

EPA SAMPLE NO.

GAC-SLP4TFBDEX

Lab Name: OUANTERRA

Contract:

Lab Code:

Case No.: 57409

SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-01FD

Sample wt/vol:

4200

LOW

(g/ml) ML

Lab File ID:

C1067

% Moisture:

Level:

(low/med)

decanted: (Y/N)

Date Received: 10/08/97 Date Extracted:10/09/97

Concentrated Extract Volume:

0.5(ml)

Date Analyzed: 11/11/97

Injection Volume:

1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 6.0

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) NG/L

Q

57-97-6----7,12-Dimethylbenz(a)anthrace 56-49-5----3-Methylcholanthrene

2.7 0 3.3 U

3/90

EPA SAMPLE NO.

GAC-SLP10TEX

Lab Name: QUANTERRA

Contract:

Lab Code:

Case No.: 57409 SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-02

Sample wt/vol: 4200 (g/ml) ML

Lab File ID:

C1074

CONCENTRATION UNITS:

Date Received: 10/09/97

Level: (low/med) LOW

Date Extracted:10/07/97

% Moisture: ____ decanted: (Y/N)___

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 11/11/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

CAS NO.	COMPOUND	(ug/L or ug/Kg) NG/L	Q
			-
			_

<u>,,,,,,,, .</u>		
271-89-62,3-Benzofuran	4.8	υ
496-11-72,3-Dihydroindene	14	
95-13-61H-Indene	0.86	
91-20-3Naphthalene	6.2	
95-15-8Benzo (b) thiophene	0.86	
91-22-5Quinoline	6.6	
120-72-91H-Indole	2.4	
91-57-62-Methylnaphthalene	3.7	ប៊
91-57-62-Methylnaphthalene	2.7	
90-12-01-Methylnaphthalene		
92-52-4Biphenyl	4.1	_
208-96-8Acenaphthylene	1.3	ַ
83-32-9Acenaphthene	6.5	
132-64-9Dibenzofuran	0.95	ับ
86-73-7Fluorene	2.0	
132-65-0Dibenzothiophene	1.0	ับ
85-01-8Phenanthrene	2.0	ļ <u></u>
120-12-7Anthracene	2.6 5.8 1.8	Ŭ
260-94-6Acridine	5.8	U
86-74-8Carbazole	1.8	ן ט
206-44-0Fluoranthene	3.0	U
129-00-0Pyrene	1.3	U
56-55-3Benzo(a)Anthracene	2.4	
218-01-9Chrysene	2.7	U
218-01-9Chrysene 207-08-9Benzo(b) fluoranthene	2.4	U
205-08-9Benzo(k) fluoranthene	2,2	U
192-97-2Benzo (e) pyrene	1.8	Ū
50-32-8Benzo(a)pyrene	2.2	Ϊ́υ
198-55-0Pervlene	2.4	۱ ۵
193-39-5Indeno(1,2,3-cd)pyrene	2.0	l ប៊
53-70-3Dibenzo(a,h) anthracene	1.5	
191-24-2Benzo(g,h,i)perylene	2.7	
TOT 21 2 Delizo (8) 11, 1 / Pet 3 telle	2.7	٦
	. I	

EPA SAMPLE NO.

GAC-SLP10TEX

Contract: Lab Name: QUANTERRA Case No.: 57409 SAS No.: SDG No.: 57409 Lab Code: Lab Sample ID: 57409-02 Matrix: (soil/water) WATER Lab File ID: Sample wt/vol: 4200 (q/ml) ML C1074 Date Received: 10/09/97 Level: (low/med) LOW Date Extracted:10/07/97 % Moisture: decanted: (Y/N) Concentrated Extract Volume: 0.5(ml)Date Analyzed: 11/11/97 Dilution Factor: 1.0 Injection Volume: 1.0(uL) pH: 7.0 GPC Cleanup: (Y/N) N CONCENTRATION UNITS: (ug/L or ug/Kg) NG/L 0 CAS NO. COMPOUND

57-97-6----7,12-Dimethylbenz(a)anthrace 2.7 U 56-49-5----3-Methylcholanthrene 3.3 U

EPA SAMPLE NO.

GAC-SLP4TMSEX

Lab Name: QUANTERRA

Contract:

Lab Code:

Case No.: 57409 SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-01MS

Sample wt/vol: 4200 (g/ml) ML

Lab File ID:

C1076

Level: (low/med) LOW

Date Received: 10/08/97

% Moisture: _____ decanted: (Y/N)____

Concentrated Extract Volume: 0.5(ml)

Date Extracted:10/07/97

Injection Volume:

1.0(uL)

Date Analyzed: 11/11/97

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

CAS NO.	COMPOUND	CONCENTRATION (ug/L or ug/L		Q
496-11-7 95-13-6 91-20-3 91-22-5 120-72-9 91-57-6 90-12-0 92-52-4 208-96-8 83-32-9 132-64-9 86-73-7 120-12-7 260-94-6 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-01-9 193-39-5 193-39-5 193-39-5	NaphthaleneBenzo(b)thiophQuinoline1H-Indole2-Methylnaphth1-MethylnaphthBiphenylAcenaphthyleneAcenaphtheneDibenzofuranFluoreneDibenzothiophePhenanthreneAcridineCarbazoleFluorantheneChryseneBenzo(b)fluoraBenzo(c)pyreneBenzo(a)pyrene	ene alene alene ne cene dipyrene thracene	9 2 8 2 4 1 0 9 1 1 3 2 5 1 1 2 2 4 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	U

(q/ml) ML

EPA SAMPLE NO.

GAC-SLP4TMSEX

Lab Name: QUANTERRA

Contract:

Lab Code:

Case No.: 57409

SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-01MS

Sample wt/vol:

4200

Lab File ID:

C1076

LOW

Level:

(low/med)

0.5(ml)

Date Received: 10/08/97

% Moisture:

decanted: (Y/N)____

Date Extracted: 10/07/97

Concentrated Extract Volume:

Date Analyzed: 11/11/97

Injection Volume:

1.0(uL)

Dilution Factor: 1.0

GPC Cleanup:

(Y/N) N

pH: 7.0

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) NG/L

Q

57-97-6-----7,12-Dimethylbenz(a)anthrace 56-49-5----3-Methylcholanthrene_____

2.7 U

3.3 U

EPA SAMPLE NO.

GAC-SLP4TMSDEX

Lab Name: QUANTERRA

Contract:

Lab Code:

Case No.: 57409 SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-01SD

Sample wt/vol: 4200 (g/ml) ML

Lab File ID: C1077

Level: (low/med) LOW

Date Received: 10/08/97

% Moisture: ____ decanted: (Y/N)____

Date Extracted:10/07/97

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 11/11/97

Injection Volume: 1.0(uL)

Dilution Factor: 1.0

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/K	g) NG/L	Q
271-89-6 496-11-7 95-13-6 91-20-3 91-22-5 120-72-9 91-57-6 90-12-0 92-52-4 208-96-8 208-96-8 132-64-9 132-65-0 85-01-8 120-12-7 260-94-6 260-94-6 260-94-6 129-00-0 56-55-3 218-01-9 207-08-9 205-08-9 205-08-9 198-55-0	2,3-Benzofuran2,3-Dihydroinden1H-IndeneNaphthaleneBenzo(b)thiophenQuinoline1H-Indole2-MethylnaphthalBiphenylAcenaphthyleneAcenaphthyleneDibenzofuranFluoreneDibenzothiopheneAcridineAcridineAcridineCarbazoleFluorantheneBenzo(a)AnthraceBenzo(b)fluorane	neleneenethenethene	4.8 12 9.10 2.6 2.4 9.7 4.1 1.3 0.9 9.8 1.9 9.8 1.9 1.3 2.4 2.8 2.4 2.2 2.4	מממממ מממממ מ
198-55-0 193-39-5 53-70-3	Perylene Indeno(1,2,3-cd) Dibenzo(a,h)antl	hracene	2.4 2.0 1.5 2.7	U U U

EPA SAMPLE NO.

GAC-SLP4TMSDEX

Lab Name: QUANTERRA

Contract:

Lab Code:

Case No.: 57409

SAS No.:

SDG No.: 57409

Matrix: (soil/water) WATER

Lab Sample ID: 57409-01SD

Sample wt/vol:

4200 (g/ml) ML

Lab File ID:

C1077

Level:

(low/med)

LOW

Date Received: 10/08/97

% Moisture:

decanted: (Y/N)____

0.5(ml)

Date Extracted:10/07/97

Concentrated Extract Volume:

Date Analyzed: 11/11/97

Injection Volume:

1.0(uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH: 7.0

CONCENTRATION UNITS:

(ug/L or ug/Kg) NG/L

0

CAS NO.

COMPOUND

57-97-6----7,12-Dimethylbenz(a)anthrace 56-49-5----3-Methylcholanthrene____ 2.7 0 3.3 U

HER DAMELL NO.

PCJ-SLP10 GAC - FEED

Lab Name: QUANTERRA

Contract:

SDG No.: 57147

Lab Code:

Case No.: 57147 SAS No.:

Matrix: (soil/water) WATER

Sample wt/vol: 4200 (g/ml) ML

Lab File ID:

C0900

Level: (low/med) LOW

Date Received: 09/24/97

% Moisture: decanted: (Y/N)____

0.5(ml)

Date Extracted: 09/25/97

Lab Sample ID: 57147-08

Concentrated Extract Volume:

Date Analyzed: 10/31/97

Injection Volume: 1.0(uL)

Dilution Factor: 10.0

271-89-62,3-Benzofuran 48 U 496-11-72,3-Dihydroindene 360 95-13-6	CAS NO.	COMPOUND	CONCENTRA (ug/L or		Q
191-24-2Benzo(g,h,i)perylene 27 U	496-11-7 95-13-6 91-20-3 91-22-5 120-72-9 91-57-6 90-12-0 92-52-4 208-96-8 83-32-9 132-64-9 86-73-7 132-65-0 85-01-8 120-12-7 260-94-6 260-94-6 206-44-0 129-00-0 56-55-3 218-01-9 207-08-9 192-97-2 193-39-5 193-39-5 193-39-5	-2,3-Dihydroindene -1H-Indene -Naphthalene -Benzo(b)thiophene -Quinoline -1H-Indole -2-Methylnaphthale -1-Methylnaphthale -Biphenyl -Acenaphthylene -Acenaphthene -Dibenzofuran -Fluorene -Dibenzothiophene -Phenanthrene -Acridine -Carbazole -Fluoranthene -Pyrene -Benzo(a)Anthracer -Chrysene -Benzo(b)fluoranth -Benzo(c)pyrene -Benzo(a)pyrene -Perylene -Perylene -Indeno(1,2,3-cd)p-Dibenzo(a,h)anthracer	ene ene ene ene ene ene ene ene ene ene	360 15 62 59 64 37 27 41 180 760 25 260 34 15 26 27 24 27 24 22 24 27 21 21 21 21 21 21 21 21 21 21 21 21 21	מממממם ממממ מ

PCJ-SLP4 GAC - FEED

Tab Name: QUANTERRA DENVER Contract:

ےab Code:

Case No.: 54628 SAS No.:

SDG No.: 54628

Matrix: (soil/water) WATER

Lab Sample ID: 54628-01

Sample wt/vol:

4200 (g/ml) ML

Lab File ID: A0601867

Level: (low/med) LOW

Date Received: 04/15/97

% Moisture: ____ decanted: (Y/N)___

Date Extracted:04/15/97

Concentrated Extract Volume:

0.5(ml)

Date Analyzed: 05/06/97

Injection Volume: 1.0(uL)

Dilution Factor: 2.0

CAS NO.	COMPOUND	CONCENT	 		Q
496-11-7 95-13-6 91-20-3 91-22-5 120-72-9 91-57-6 91-57-6 92-52-4 92-52-4 208-96-8 132-64-9 86-73-7 132-65-0 120-12-7 260-94-6 129-00-0 266-55-3 218-01-9 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-00-0 129-07-08-9 192-97-2 50-32-8 193-39-5 193-39-5	NaphthaleneBenzo (b) thiopherQuinoline1H-Indole2-Methylnaphthal1-MethylnaphthalBiphenylAcenaphthyleneAcenaphtheneDibenzofuranFluoreneDibenzothiophenePhenanthreneArthraceneAcridineCarbazoleFluoranthenePyreneBenzo (a) AnthraceChryseneBenzo (b) fluorantBenzo (c) pyreneBenzo (a) pyrene	lene Lene Lene Lene Lene Lene Lene Lene		9.10 128 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.	ממממממממ ממ מממממממ מממממממ



Quanterra Incorporated 4955 Yarrow Street Arvada, Colorado 80002

303 421-6611 Telephone 303 431-7171 Fax

CASE NARRATIVE

FOR

City of St. Louis Park

December 17, 1997

Quanterra Environmental Services

Project Number 057392

Introduction

Seven aqueous samples (including matrix QC) were received at Quanterra Environmental Services, Denver Laboratory on October 8, 1997. The samples were logged in under Quanterra Denver's project number 057392. A cross reference associating Quanterra Denver's laboratory sample numbers to the actual field sample number is included. The samples were analyzed for Acid Fraction only by method 8270.

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in the October 1996 QAPP for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered which would impact the interpretation or use of data in this report.

The surrogate compounds phenol-d5, 2-fluorophenol, 2-chlorophenol-d4 and 1,2-dichlorobenzene-d4 were recovered low outside QC limits in the Field Blank sample. The Field Blank Duplicate sample was analyzed with all surrogates in control. Both sets of data are reported.



Except for the above, this data package is in compliance with the terms and conditions of the October 1996 QAPP, both technically and for completeness

Reported By:

Kurt C. III

Program Manager



SAMPLE DESCRIPTION INFORMATION for City of St. Louis Park

Lab ID	Client ID	Matrix	Sampled Date Time	Received Date
057392-0001-SA 057392-0001-DU 057392-0001-MS 057392-0001-SD 057392-0002-FB 057392-0002-FD	GAC-SLP4TAF-100797 GAC-SLP4TDAF-100797 GAC-SLP4TMSAF-100797 GAC-SLP4TMSDAF-100797 GAC-SLP4TFBAF-100797	AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS AQUEOUS	07 OCT 97 07 OCT 97 07 OCT 97 07 OCT 97 07 OCT 97 07 OCT 97 07 OCT 97	08 OCT 97 08 OCT 97 08 OCT 97 08 OCT 97 08 OCT 97 08 OCT 97
057392-0003-SA	GAC-SLP10TAF-100797	AQUEOUS	07 OCT 97	08 OCT 97



ANALYTICAL TEST REQUESTS for City of St. Louis Park

Page 1 of 1

Lab ID: 057392	Group Code	Analysis Description	Custom Test?
0001 - 0003	Α	TCL Acid Organics for City of St. Louis Park Prep - Acid Organics by GC/MS	N N
0002	В	TCL Acid Organics for City of St. Louis Park Prep - Acid Organics by GC/MS	N N

SLP4TAF

Lab Name: QUANTERRA DENVER

Contract:

SDG No.: 57392

Lab Code:

Case No.: 57392 SAS No.:

Matrix: (soil/water) WATER

Lab Sample ID: 57392-01

Sample wt/vol: 1054 (g/ml) ML

Lab File ID: E6405

Date Received: 10/08/97

Level: (low/med) LOW

% Moisture: ____ decanted: (Y/N)___

Date Extracted:10/13/97

Concentrated Extract Volume: 0.5(ml)

Date Analyzed: 11/19/97

Injection Volume: 2.0(uL)

Dilution Factor: 2.0

С	AS NO.	COMPOUND	CONCENTRATION (ug/L or ug/		Q
9918115895158	06-44-5 8-75-5	-2-Chlorophenol -2-Methylphenol -4-Methylphenol -2-Nitrophenol -2-Vitrophenol -2-Chloro-3-Methy -2-Chloro-3-Methy -2-4-Chloro-1-Chlorophenol -2-4-Dinitrophenol -4-Nitrophenol -4-Ophenol	ol lphenol enol henol thylphenol	9 9 9 9 9 9 9 47 47 47 47	מממממממממממ

SLP4TDAF Lab Name: QUANTERRA DENVER Contract: SDG No.: 57392 Case No.: 57392 SAS No.: Lab Code: Lab Sample ID: 57392-01DU Matrix: (soil/water) WATER Sample wt/vol: 1060 (q/ml) ML Lab File ID: E6406 Date Received: 10/08/97 Level: (low/med) LOW _____ decanted: (Y/N)___ Date Extracted:10/13/97 % Moisture: 0.5(ml)Date Analyzed: 11/19/97 Concentrated Extract Volume: Dilution Factor: 2.0 Injection Volume: 2.0(uL) GPC Cleanup: (Y/N) N pH: 7.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L CAS NO. COMPOUND 108-95-2----Phenol 95-57-8----2-Chlorophenol 95-48-7----2-Methylphenol 106-44-5----4-Methylphenol 88-75-5----2-Nitrophenol 105-67-9----2 4-Dimethylphenol 120-83-2----2 4-Dichlorophenol 59-50-7-----4-Chloro-3-Methylphenol_ 88-06-2----2 4 6-Trichlorphenol 95-95-4----2 4 5-Trichlorophenol 47 51-28-5----2 4-Dinitrophenol U 100-02-7-----4-Nitrophenol 534-52-1-----4 6-Dinitro-2-methylphenol 47 U 47 U 87-86-5-----Pentachlorophenol_65-85-0-----Benzoic Acid 47 U

SLP4TFBAF Lab Name: QUANTERRA DENVER Contract: Lab Code: Case No.: 57392 SAS No.: SDG No.: 57392 Matrix: (soil/water) WATER Lab Sample ID: 57392-02FB Sample wt/vol: 1054 (g/ml) ML Lab File ID: E6409 Level: (low/med) LOW Date Received: 10/08/97 % Moisture: ____ decanted: (Y/N)__ Date Extracted:10/13/97 Concentrated Extract Volume: 0.5(ml) Date Analyzed: 11/20/97 Injection Volume: 2.0(uL) Dilution Factor: 2.0 GPC Cleanup: (Y/N) N pH: 7.0

108-95-2Phenol 9 U 95-57-82-Chlorophenol 9 U 95-48-72-Methylphenol 9 U 106-44-54-Methylphenol 9 U 88-75-52-Nitrophenol 9 U 105-67-92-4-Dimethylphenol 9 U 120-83-22-4-Dichlorophenol 9 U 59-50-74-Chloro-3-Methylphenol 9 U 88-06-22-4-Chlorophenol 9 U 95-95-42-4-S-Trichlorophenol 47 U 51-28-52-4-Dinitrophenol 47 U 100-02-7	CAS NO.	COMPOUND	(ug/L or	ug/Kg)	UG/L	Q
	95-57-8 95-48-7 106-44-5 88-75-5 105-67-9 120-83-2 59-50-7 88-06-2 95-95-4 51-28-5 100-02-7 87-86-5	2-Chloropheno 2-Methylpheno 2-Nitrophenol 2-1-Dimethylphenol 2-4-Dichlorophenol 2-4-Chloro-3-Me 2-4-6-Trichlorophenol 2-4-Dinitrophenol 4-Nitrophenol 4-Ophinitrophenol	henol henol thylphenol rphenol rophenol enol -methylphenol		9999999947474747	ממממממממממממ

CONCENTRATION UNITS:

51-28-5-----2 4-Dinitrophenol

87-86-5----Pentachlorophenol

534-52-1----4 6-Dinitro-2-methylphenol

100-02-7----4-Nitrophenol

65-85-0-----Benzoic Acid

SLP4TFBDAF Lab Name: OUANTERRA DENVER Contract: Case No.: 57392 Lab Code: SAS No.: SDG No.: 57392 Matrix: (soil/water) WATER Lab Sample ID: 57392-02FD Sample wt/vol: 1058 (q/ml) ML Lab File ID: E6410 Level: (low/med) Date Received: 10/08/97 LOW Date Extracted:10/13/97 % Moisture: decanted: (Y/N)___ 0.5(ml)Date Analyzed: 11/20/97 Concentrated Extract Volume: Dilution Factor: 2.0 Injection Volume: 2.0(uL) GPC Cleanup: (Y/N) N pH: 7.0 CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L 0 9999999999 108-95-2----Phenol 95-57-8----2-Chlorophenol 95-48-7----2-Methylphenol 106-44-5-----4-Methylphenol 88-75-5----2-Nitrophenol 105-67-9-----2 4-Dimethylphenol_ 120-83-2----2 4-Dichlorophenol 59-50-7----4-Chloro-3-Methylphenol_ 88-06-2----2 4 6-Trichlorphenol 95-95-4-----2 4 5-Trichlorophenol lυ

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BEA SAMPLE NU.

SLP10TAF Lab Name: QUANTERRA DENVER Contract: Case No.: 57392 SAS No.: SDG No.: 57392 Lab Code:

Lab Sample ID: 57392-03 Matrix: (soil/water) WATER

Sample wt/vol: 1055 (g/ml) ML Lab File ID: E6411

Date Received: 10/08/97 Level: (low/med) LOW

% Moisture: ____ decanted: (Y/N)___ Date Extracted:10/13/97

Date Analyzed: 11/20/97 Concentrated Extract Volume: 0.5(ml)

Dilution Factor: 2.0

Injection Volume: 2.0(uL)

CAS NO.	COMPOUND	CONCENTRATION (ug/L or ug/		Q
95-48-7 106-44-5 88-75-5 105-67-9 120-83-2 59-50-7 88-06-2 95-95-4 51-28-5 100-02-7 534-52-1 87-86-5	Phenol2-Chlorophenol2-Methylphenol2-Nitrophenol2-Nitrophenol2-Nitrophenol2-A-Dichlorop2-4-Chloro-3-Mo2-4-S-Trichlo2-4-Dinitrophenol4-Nitrophenol4-Nitrophenol	ol ol phenol phenol ethylphenol orphenol henol l 2-methylphenol henol	9 9 9 9 9 9 47 47 47 47 47	ַ עֹי

534-52-1----4 6-Dinitro-2-methylphenol

87-86-5-----Pentachlorophenol

65-85-0-----Benzoic Acid

SLP4TMSAF Lab Name: QUANTERRA DENVER Contract: Case No.: 57392 SAS No.: SDG No.: 57392 Lab Code: Matrix: (soil/water) WATER Lab Sample ID: 57392-01MS 1057 (g/ml) ML Sample wt/vol: Lab File ID: E6407 (low/med) Date Received: 10/08/97 Level: LOW % Moisture: _____ decanted: (Y/N)____ Date Extracted:10/13/97 0.5(ml) Date Analyzed: 11/19/97 Concentrated Extract Volume: Dilution Factor: 2.0 Injection Volume: 2.0(uL) GPC Cleanup: (Y/N) N pH: 7.0 CONCENTRATION UNITS: CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q 108-95-2----Phenol 50 95-57-8----2-Chlorophenol 53 95-48-7----2-Methylphenol_ 9 9 106-44-5----4-Methylphenol U 999 88-75-5----2-Nitrophenol U 105-67-9-----2 4-Dimethylphenol 120-83-2----- 4-Dichlorophenol U U 59-50-7----4-Chloro-3-Methylphenol_ 56 88-06-2-----2 4 6-Trichlorphenol 95-95-4-----2 4 5-Trichlorophenol 51-28-5-----2 4-Dinitrophenol 9 ℧ 47 U 47 U 100-02-7----4-Nitrophenol 64

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SLP4TMSDAF

Lab Name: QUANTERRA DENVER

Contract:

Lab Code:

Case No.: 57392 SAS No.: SDG No.: 57392

Matrix: (soil/water) WATER

Lab Sample ID: 57392-01SD

Sample wt/vol: 1057 (g/ml) ML Lab File ID: E6408

CONCENTRATION UNITS:

Level: (low/med) LOW

Date Received: 10/08/97

% Moisture: ____ decanted: (Y/N) ___ Date Extracted:10/13/97

Concentrated Extract Volume: 0.5(ml) Date Analyzed: 11/19/97

Injection Volume: 2.0(uL)

Dilution Factor: 2.0

108-95-2Phenol 54 95-57-82-Chlorophenol 59 95-48-72-Methylphenol 9 U 106-44-54-Methylphenol 9 U 105-67-92-Nitrophenol 9 U 105-67-92-4-Dimethylphenol 9 U 120-83-22-4-Dichlorophenol 9 U 59-50-74-Chloro-3-Methylphenol 62 88-06-22-4-Chloro-3-Methylphenol 9 U 95-95-42-4-S-Trichlorophenol 9 U 51-28-52-4-Dinitrophenol 47 U 100-02-74-Nitrophenol 74 534-52-14-6-Dinitro-2-methylphenol 47 U	CAS NO.	COMPOUND	(ug/L or	ug/Kg)	UG/L	Q
87-86-5Pentachlorophenol 66	95-57-8 95-48-7 106-44-5 88-75-5 105-67-9 120-83-2 59-50-7 88-06-2 95-95-4 51-28-5 100-02-7 534-52-1	2-Chloropheno2-Methylpheno4-Methylpheno2-Nitrophenol2-4-Dimethylp2-4-Chloro-3-Me2-4-5-Trichlo2-4-Dinitrophenol4-Nitrophenol	henol henol thylphenol rphenol rophenol enol -methylpheno		5. 5. 6. 4. 4. 7. 4.	9 U U 9 U U 9 U U 9 U U 9 U U 9 U U 9 U U 9 U U 9 U U 9 U U 9 U U 7 U U 7 U U 4 U 9 U U 9 U U 9 U 9 U 9 U 9 U 9 U